

American Fruit Grower

JANUARY • 1961

25 CENTS

PRODUCTION

• PACKING

• MARKETING



**The Tractor and Truck
Bring Power to the
Orchard**

**Grower Experience with
Automation**

Mechanical Harvesting

**Horticultural and
Economic Aspects of
Mechanical Harvesting**

Power on the Fruit Farm

Only **GLYODIN** *Fungicide*

gives you **TOP-QUALITY**
with **ECONOMY!**

You get powerful, all-season protection against scab and summer diseases by using CRAG Glyodin. And by combining Glyodin with phenyl mercury for back-action with sulfur for mildew, and with carbamates for rusts and rots, you use its ideal sticking and wetting properties for remarkably complete disease control. Glyodin pays more ways—and it costs as little as 73¢ per 100 gallons of early sprays and 55¢ per 100 gallons of cover sprays.

Scab control on apples and pears is easy and economical with a simple Glyodin protective program. On apples, Glyodin works perfectly with phenyl mercury for 48-hour "back-action" plus future protection. Glyodin used with sulfur or "Karathane" fungicide provides highly efficient mildew and scab control. Use Glyodin through your summer program too, to maintain full protection.

Improve insect control with Glyodin in all your sprays. CRAG Glyodin teams up with important insecticides to make them more effective than when other fungicides are used.

Suppress mites by using Glyodin both in early sprays and summer sprays. Glyodin suppresses both adults and nymphs, and often saves the cost of special mite sprays.

The ideal spreader-sticker, liquid Glyodin spreads and sticks the whole spray mix in a thin, smooth, protective film on fruit and foliage. Glyodin helps you get ideal pest control plus fine finish and color. Glyodin is compatible with most spray chemicals.

Protect your profits this season by using Glyodin—the economical top-quality fungicide. Glyodin controls scab and improves your whole spray program at low, low cost. See your Glyodin supplier now!

"Crag" and "Union Carbide" are trade marks of Union Carbide Corporation.

UNION CARBIDE CHEMICALS COMPANY

Division of Union Carbide Corporation • 270 Park Avenue • New York 17, New York

**UNION
CARBIDE**

POWER

that **L-A-S-T-S!**



Power that won't give up if the going gets tough! Durable tractor power that stays on the job dependably, economically, year after year! That's the kind of power you need . . . power that L-A-S-T-S . . . Case power . . . to keep production up, the cost of production down.

Why Case power? Because Case builds tractors without compromise . . . specifically for heavy-duty farm work. No warmed-over truck or automotive engines with their short-lived bursts of power. In the 3-plow Case 430 tractor, for example, the 188 cubic inch Dynaclone diesel engine has famous Case long stroke design that keeps the 430 lugging where others would give up . . . a high 17.5 to 1 compression ratio to squeeze more power from every drop of fuel . . . revolutionary Dynaclone "controlled turbulence" that swirls in extra large volumes of air to assure thorough mixing and more complete utilization of fuel.

What gives this Dynaclone diesel its proven strength and staying power for long hard years of use? It's the combination of a rugged heavily-ribbed block with the rigidity and strength to keep precision parts in positive alignment . . . hefty induction-hardened crankshaft counter-balanced to run smooth-as-silk . . . aluminum alloy pistons to lighten the bearing load . . . five main bearings that give full support to the crankshaft on both sides of the power stroke.

Dynaclone in 3 Power Sizes

The new Dynaclone diesels are available in the 35 hp* 430, 40 hp* 530 and 50 hp* 630 tractors. The 530 and 630

are available with famous Case-o-matic Drive® that provides up to double pull-power automatically as needed.

CASE 430—Big-Tractor Stamina

. . . Small-Tractor Maneuverability
Stamina to pull heavy disks, sprayers, wagons . . . yet small-tractor economy and utility for lighter jobs. Low and compact . . . the standard 4-wheel model (above) is only 49½ inches to top of the hood . . . turns in a 10 foot radius. Dual front and adjustable front axle models also available.

Standard 4-speed, 12-speed, or shuttle transmission. Case Eagle Hitch or flexible 3-point hitch that handles most any 3-point implements.

Get a Proof Demonstration

Get full details on Case power and durability from your dealer. See the tractor model and tool you're interested in demonstrated on your farm. Call your Case dealer today! No obligation.

*Sea level (calculated) max. b.h.p. (based on 60°F and 29.92 in. Hg.), Manufacturer's rating. Not yet tested at Nebraska.



210 Tractor-Loader. Low in price but high on power, stamina, speed and maneuverability. Lifts ½-ton 125" high. Available with shuttle transmission and power steering.

CROP-WAY PURCHASE PLAN

lets you buy now . . . make later payments as your money comes in. Get all the facts from your Case dealer.

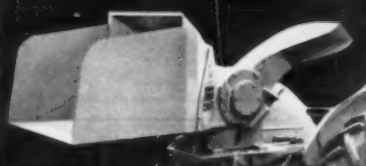
CASE®

J. I. CASE CO. • RACINE, WIS.

1st in Quality for Over 100 Years



Mulch Your Orchard with a **FITCHBURG CHIPPER**



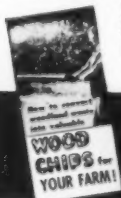
Save Labor and Save MOISTURE



Right now, you can save hard summer work in your orchard by chipping tree prunings with a Fitchburg Farm Chipper, and mulch your orchard in one labor saving operation. Wood chips blown around the trunk will hold up to four times their weight in moisture. Moisture helps put your fertilizer to work and the additional moisture will carry your orchards through summer dry spells at top production.

A Fitchburg Farm Chipper is designed to work in your orchard... wherever you can drive your tractor! The high chrome steel blades need only periodic sharpening to keep their tough, keen edges. The patented spring-activated feed plate—exclusive with Fitchburg Farm Chippers—assures you of safe, one-man operation. And you have a One Year Guarantee.

For as little as \$650 you can have a Fitchburg Farm Chipper working for you in your orchard this summer; or the heavy duty brush and bedding chipper can be bought for \$960. Either will give you a good cost return in labor saving and increased fruit production.



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receive a Free Copy
of "WOOD CHIPS"**

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Fitchburg, Mass., Dept. AFG-61

Send my free copy of "Wood Chips"

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Address or R.F.D. _____

Town _____

State _____

We have (Make and Model) Tractor



American Fruit Grower

Cover photo by F. Leland Elam shows a tricycle knocking boom shaking peaches into canvas frames at John Sasaki Ranch, Marysville, Calif. See article on page 16.

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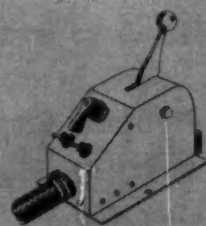
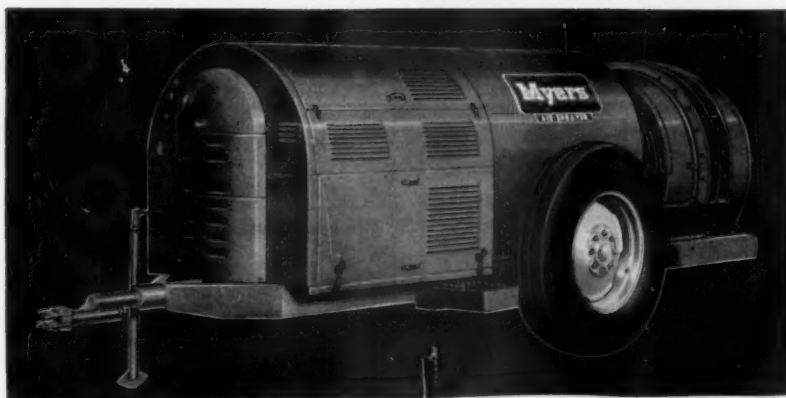
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When changing your address, please send us old as well as new; send address label from your last copy; allow 6 weeks for the first copy to reach your new address.

Entered as second class matter at Post Office at Willoughby, Ohio, under the Act of March 3, 1879. Additional entry at Mount Morris, Illinois.

Postmaster: Please send change of address "Form 3579" to AMERICAN FRUIT GROWER, Willoughby, Ohio.

IMPROVED AIR PERFORMANCE GIVES GREATER PROTECTION REDUCES SPRAYING COSTS!



Touch-Matic Control

Mounts on tractor, gives operator complete control at finger tips—hydraulically opens and closes discharge valves for right, left or two-way spraying.

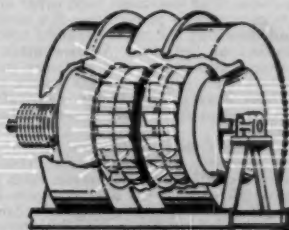
Specifications Myers Air Sprayers

MODEL NUMBER	ENGINE	TANK SIZE	FAN TYPE	AIR-CLASS C.F.M.	REMOTE CONTROL DISCHARGE
58120-232ET5	Water Cooled Gasoline	500	Twin 32" Centrifugal Fans	80,000 at 80-90 MPH	Touch-Matic***
6095-227ET5	Water Cooled Gasoline*	500**	Twin 26" Centrifugal Fans	60,000 at 80-90 MPH	Touch-Matic***
6095-225ET4	Water Cooled Gasoline	400	Twin 24" Centrifugal Fans	45,000 at 80-90 MPH	Touch-Matic***
6040-A36ET4	Air Cooled Gasoline	400	Axial Flow 36"	30,000 at 60-80 MPH	Manual

*6095-227ET5 Also available with Diesel Engine.

**400 Gallon Tank and High Pressure Piston Pump Optional.

***Discharge valves activated through electrically controlled hydraulic system.



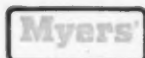
Air Handling Technique

Twin centrifugal fans put high volume of air directly into tree foliage—air is delivered straight off fan blades with velocities up to 90 MPH.

Exclusive Myers air handling technique gives you air sprayer performance that really penetrates, really covers, really protects! VERSATILE TOO! Ability to overcome adverse spraying conditions is an important requirement for successful air spraying. With a Myers, you can spray from both sides simultaneously or close off either side without loss of air volume or velocity. Tapered air outlets, new high pressure pump, drive-mist nozzles and greater air volume combine to deliver the penetrative power needed to properly protect all areas of the tree. Application is fast, economical and efficient. Touch-Matic control provides instant stop-start action, keeps waste at a minimum and greatly reduces spraying costs.

Prove to yourself

—ask your Myers sprayer dealer for a demonstration in your own grove or orchard, or write to:



The F. E. Myers & Bro. Co.

ASHLAND, OHIO

KITCHENER, ONTARIO

**HERE'S THE ANSWER TO
RISING PRODUCTION COSTS!**

STARKRIMSON DELICIOUS. APPLE TREES

**Sensational New Semi-Dwarf
Fruit-Spur Type Tree
Gives Bigger, Better Colored,
More Profitable Crops—QUICKER
—At Lower Cost of Production**

Leading horticulturists, growers and shippers acclaim the Starkrimson Delicious as the quickest bearing, reddest, most regular money-maker of all red Delicious Apples—a perfect team-mate for top quality, young-bearing Stark Golden Delicious.

Starkrimson is the answer to a semi-dwarf tree of the Delicious variety. Very little pruning is needed once these trees get into full production.

BEST COLOR OF ALL RED DELICIOUS

Careful comparative evaluation of the STARKRIMSON (Bisbee Strain) of Delicious with other spur type trees has now conclusively proven that this strain colors earliest and develops the most beautiful color of all spur type strains of Delicious. Studies made by qualified horticultural authorities and growers in the western and eastern fruit growing areas where the fruit spur strains have been grown under identical soil and climatic conditions have now proven color superiority of Starkrimson.

Starkrimson Delicious (Bisbee Strain) is the strain that will give you good, extra fancy color every year. This higher color factor will mean extra profit to you.

Leading Horticulturists and growers reporting on advantages of Fruit-Spur Trees state that Spur Trees have the following characteristics: (1) Fruit-Spur Type Trees bear younger. (2) They are about $\frac{3}{4}$ the size of normal trees. (3) More resistant to winter freezes and spring frosts. (4) Fruit set is heavier. (5) All costs are substantially reduced and experienced fruit growers are now convinced that Starkrimson Delicious apples can be produced at least 25¢ per box cheaper on spur type trees. Much less pruning is necessary.

**Big New
Color Catalog FREE**



Send coupon below for our latest catalog and special commercial prices on Stark World's Champion Apple, Peach, Cherry, Pear, Plum Trees, etc. See new varieties, genuine Stark "Record-Bearing" strain Standard and Dwarf Trees. See how you can insure your future profits—today!

Turn Spare Hours Into Easy Cash Writing Stark Orders

Introduce Stark Bro's super-quality nursery stock in your locality—spare or full time. Friendly, easy work pays amazing extra income to folks all over America. Check coupon at right and we will send you our big FREE money-making Outfit and full information. No obligation.



STARKRIMSON DELICIOUS
(Bisbee)
U. S. Plant Patent
No. 1565
Trees sold ONLY
by Stark Bro's

TWICE AS MANY APPLES

Here's why it's predicted that the Starkrimson Delicious will produce twice as many apples and will double profits the first ten years.

- Bear bigger crops quicker.
- Are tops for delicious flavor.
- Bring premium prices on markets.
- Earliest coloring spur type Delicious.
- All apples can be picked at same time—less picking cost.
- Twice as many apples the first 10 years—bigger, quicker profits.
- Frost-resistant and hardy.

**SPECIAL LOW PRICES
on 50 or more
STANDARD or DWARF TREES**

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STARK BRO'S NURSERIES & ORCHARDS CO.
Box 111, Louisiana, Missouri

- ☐ Send FREE, new Stark Fruit-Landscape Catalog filled with gorgeous natural-color Photos of your 418 varieties of Fruit Trees, DWARF Fruit Trees, Flowering Shrubs, Flowering Trees, Shade Trees, Vines, Roses, Grapes, Berries... and amazing new STARKRIMSON DELICIOUS APPLE.

- ☐ Send me SPECIAL LOW COMMERCIAL PRICES. I plan to plant:

☐ Standard ☐ Dwarf Trees

Name _____
1st initial 2nd initial last name

R.F.D. or Street Address (very important) _____

P.O. _____ Zone _____ State _____

- ☐ CHECK HERE for Money-Making Sales Plans and FREE Demonstration Kit. Introduce Stark Super-Quality Varieties to friends, neighbors.

LETTERS TO THE EDITOR

That Search for Quality Fruit

Dear Editor:

The title of Dr. Lott's second article "We Can Supply Consumers With Apples of Quality" seems to imply that we do not. Speaking from the consumer's point of view, it is very difficult to buy apples of good flavor in local supermarkets, etc. There are plenty of soft, mealy, flavorless apples, but only about one time out of ten does the consumer find a crisp and flavorful supply. Quite frequently there is no indication at all of what the variety is. Surely the apple industry could provide at least 50% good quality apples.

Perhaps the situation is better in other parts of the country than here in Florida. And, perhaps Mrs. Consumer is also to blame if she is content with the kind of apple most often found on sale.

West Palm Beach, Fla. Michael Grogan

We Need Amateurs

Dear Editor:

I get so much good from the articles and the advertisements in each issue of AMERICAN FRUIT GROWER that I am writing to tell you that I appreciate your magazine very much. I am an amateur grower who takes an interest in fruits and new methods of growing them. Your magazine contains information and suggestions which are very helpful to me.

Two items in a recent issue seemed to be well worthwhile—"How To Make Good Apple Cider" and "Apple Quality." I would buy quantities of apple cider every fall if I thought it was safe and well made; and it would be a good thing if we had a quality standard for apples. We all know that the fruit in most fruit stores is far below the standard that can be attained by any amateur grower, which should be a challenge to commercial orchards.

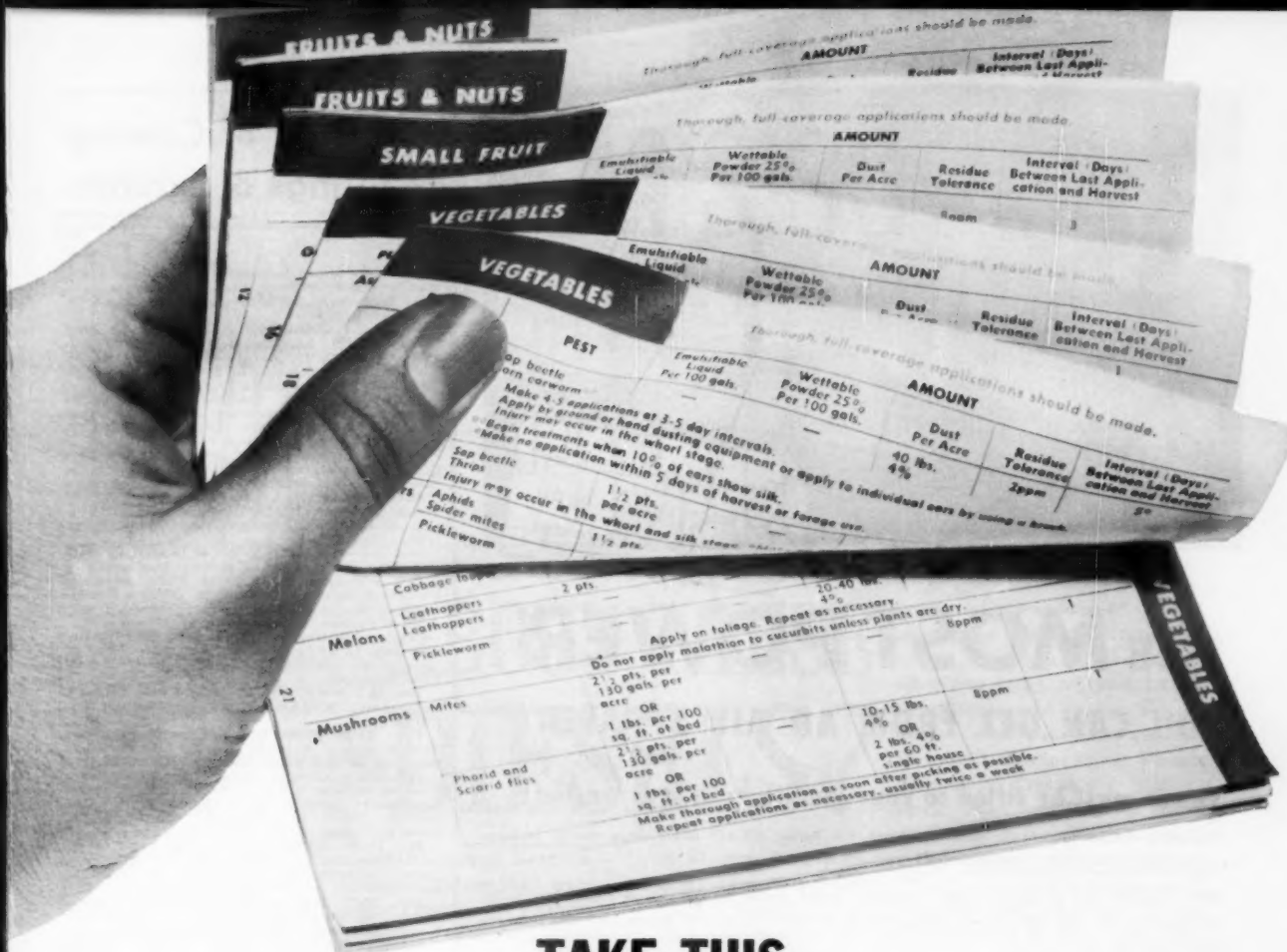
Pittsburgh, Pa. A. W. Robertson

Expert amateur grower Robertson reaffirms a point for which many leading commercial growers speak strongly. Grover Robertson is formerly chairman of the board of one of the nation's largest corporations—Westinghouse. We welcome his interest and advice and note that expert amateurs have played an important part in the progress of the fruit industry in this country. We refer to recent contributions on grapes by Philip Wagner, a newspaper editor, and on apple varieties by Robert Nitschke, a Detroit executive. Such historical figures as Nicholas Longworth, Ephraim Bull, Joseph Stayman, Marshall Wilder, John Warder, and John Adlum were also motivated solely by their appreciation for fine fruits.—Ed.

REWARDING BUSINESS

I believe that fruit growing is one of the most rewarding businesses that there is. We have the privilege of working outdoors, which is an experience a lot of people don't have. We have the pleasure of producing a product that gives the people who use it a lot of pleasure and it is also good for them. —Mason McConnell, Ravenna, Ohio, 1958 president of Ohio State Horticultural Society.

AMERICAN FRUIT GROWER



TAKE THIS 44-PAGE BOOKLET

It lists *all* malathion's uses. But it takes you just seconds to find full directions for a malathion insect control program for your fruit or vegetable crops. Directions cover insect pests, rates, timing, residue tolerances, intervals between last application and harvest.

This booklet tells you *how* to use malathion sprays and dusts. Here's *why* you should:

Malathion simplifies spray schedules. Because malathion is a powerful phosphate insecticide, it offers wide-range insect control. It takes the place of many special-purpose insecticides.

Makes safe handling easy. Malathion is low in toxicity to man. According to the USDA, it's "one of the safest insecticides to handle."

Has high residue tolerances. Because it is low in toxicity to

warm-blooded animals, malathion has high residue tolerances. And, because it leaves no persistent residues on food and feed crops, malathion greatly reduces drift-residue problems. For these reasons you can use malathion close to harvest of fruit and vegetables.

Controls resistant insects, too. Malathion controls strains of codling moth, red-banded leaf roller, cabbage looper, and other insects resistant to chlorinated insecticides.

Malathion is compatible with most commonly-used insecticides and fungicides.

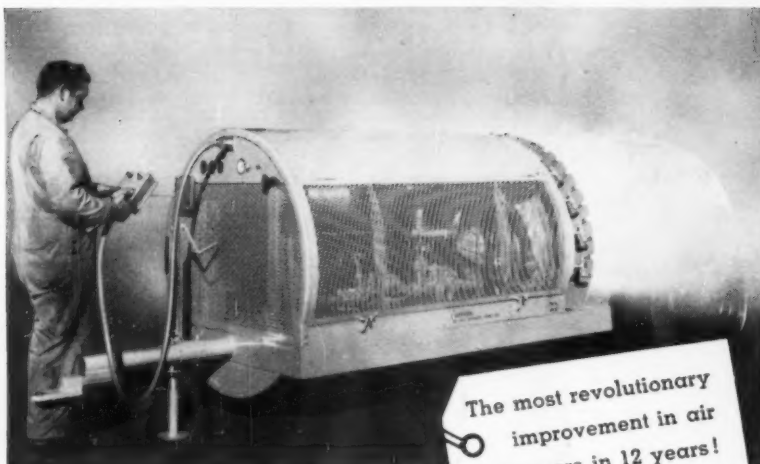
The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Governments. Always read the labels and carefully follow directions for use.



Write for your copy of this free booklet: American Cyanamid Company, Agricultural Division, New York 20, N. Y.



CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE



THE MOST POWER YOU CAN GET FROM AN AIR SPRAYER!*

Power must be fitted to your conditions or it is wasted!

To supply sprayer power for your conditions, the Besler #K-475 offers these special features unmatched in any other sprayer.

NEW DESIGN with blower in center. Compact model whose simpler design means less maintenance and less cost; sharply reduces suction of dirt and leaves into engine and fan; provides better balance.

NEW "ZOOM"—Allows field adjustment of air in volume and velocity to suit your exact needs. Now, for the first time you can run your engine at its most efficient speed and still adjust the air as needed. Provides soft "velvet" air when fruit is on the tree and for fragile foliage, plus greater velocity for other spraying. The use of high pressure at the nozzles makes it possible to carry large droplets to a greater distance because they are already moving at a high speed when picked up by the air stream.

HIGHEST "K" FACTOR of any comparable sprayer. High "K" factor (the kinetic energy of the spray) gives enormous working power. In Besler sprayers the spray is already moving at a high speed when picked up by the moving air. Eliminates much of the power waste of other sprayers in which the air alone must bring about much more acceleration of the spray droplets.

*per horsepower

Model #K-475, shown above, consists of an axial-flow 30" fan, with Ford industrial 6 engine.

Send for free booklet (NOT a sales booklet)
"How To Get Best Results From Air Spraying"



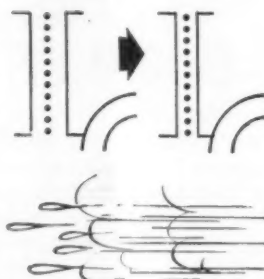
Gentlemen: AFG

Without charge, please send me your 24-page booklet explaining the latest techniques in air carrier spraying.

Name

Address

Orchard ☐ Row Crop ☐ Acreage ☐ Student ☐



Close-up of zoom feature



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CORPORATION**

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Warehouse stocks in Lansing, Mich.

Calendar of Coming Meetings & Exhibits

Jan. 4-5—Massachusetts Fruit Growers Association annual meeting, State Armory, Gardner.
—A. P. French, Sec'y, University of Massachusetts, Amherst.

Jan. 4-6—Indiana Horticultural Society joint meeting with American Pomological Society, Purdue University, Lafayette, Ind.—George M. Kessler, Sec'y-Treas., APS, Michigan State University, East Lansing.

Jan. 4-6—Western Washington Horticultural Association annual meeting, Fruitland Grange Hall, Puyallup.—Morrill Delano, Sec'y, 742 County-City Bldg., Tacoma.

Jan. 4-6—Empire State Farm Show, Onondaga County War Memorial, Syracuse, N. Y., Syracuse, N. Y.—Ned Emerson, Syracuse 2, N. Y.

Jan. 5-6—Maryland State Horticultural Society annual meeting, Hotel Alexander, Hagerstown.
—A. F. Vierheller, Sec'y, University of Maryland, College Park.

Jan. 5-6—Wisconsin Pesticide Conference with Industry, University of Wisconsin, Madison.

Jan. 6-7—Texas State Pecan Show, Memorial Student Center, Texas A & M College, College Station.—J. Benton Storey, Sec'y-Treas., Texas A & M College, College Station.

Jan. 10-11—Ohio Pesticide Institute, Nationwide Inn, Columbus.—Robert E. Treece, Dept. of Entomology, Ohio Agricultural Experiment Station, Wooster.

Jan. 16-17—Michigan Processors Raw Products Conference, Michigan State University, East Lansing.

Jan. 17-19—New York State Horticultural Society annual meeting, Manger Hotel, Rochester.—T. E. La Mont, Sec'y-Treas., Albion.

Jan. 18-19—Georgia Peach Council and Peach Growers annual meeting, Georgia Agricultural Experiment Station, Experiment.—R. L. Livingston, Ext. Horticulturist, University of Georgia, Athens.

Jan. 18-19—North Carolina State Apple Growers Association annual meeting, Battery Park Hotel, Asheville.—R. B. Phillips, Sec'y-Treas., Bakersville.

Jan. 18-19—Maine State Pomological Society annual meeting, Lewiston Armory, Lewiston.
—Howard C. Berry, Sec'y, Livermore Falls.

Jan. 18-21—Texas Citrus Fiesta, Mission Chamber of Commerce, Mission.

Jan. 19-20—Fruit and Vegetable Short Course, New Mexico State University, University Park.
—J. V. Enzie, Dept. of Horticulture, New Mexico State University, University Park.

Jan. 23-26—United Fresh Fruit & Vegetable Association annual meeting, New Orleans, La.
—R. A. Seelig, Director of Information, UFFVA, 777 Fourteenth St., N.W., Washington 5, D.C.

Jan. 23-25—New Jersey Farmers Week, Trenton, Farm Show, Trenton Armory, Jan. 23-27.—Phillip Alampi, Sec'y, New Jersey Department of Agriculture, Trenton.

Jan. 24-25—South Carolina Peach Council annual meeting, Clemson House Hotel, Clemson.
—Roy J. Ferree, Sec'y-Treas., Clemson College, Clemson.

Jan. 25-27—New York State Horticultural Society eastern meeting, Governor Clinton Hotel, Kingston.—T. E. La Mont, Sec'y-Treas., Albion.

Jan. 29-Feb. 1—Virginia State Horticultural Society annual meeting, Hotel Roanoke, Roanoke, Va.—John F. Watson, Sec'y, P.O. Box 718, Staunton.

Jan. 30-Feb. 3—Ohio State Horticultural Society and Ohio Vegetable and Potato Growers joint annual meetings, Sheraton-Cleveland Hotel, Cleveland, Ohio.—C. W. Ellenwood, Sec'y, Rt. 2, Wooster.

Jan. 31—North Carolina Mutual Peach Growers Society annual meeting, Carolina Hotel, Pinehurst.—W. F. Haywood, Sec'y, Candor.

Feb. 1—Kentucky State Horticultural Society annual meeting, University of Kentucky, Lexington.—W. W. Magill, Sec'y-Treas., University of Kentucky, Lexington.

Feb. 1—Kentucky Nut Growers Association annual meeting (in evening), University of Kentucky, Lexington.—W. W. Magill, Dept. of Horticulture, University of Kentucky, Lexington.

Feb. 6-8—State Horticultural Association of Pennsylvania annual meeting, Yorktowne Hotel, York.—J. U. Ruef, Acting Sec'y, Pennsylvania State University, University Park.

Feb. 15-16—Cold storage conference for apples and peaches, Rutgers University, New Brunswick, N. J.—Norman F. Childers, Dept. of Horticulture, Rutgers University, New Brunswick, N. J.

Feb. 16-17—Carolina-Virginia Fruit School, YMCA, Mt. Airy, N. C.—Melvin H. Kolbe, Ext. Hort., North Carolina State College, Raleigh.

Feb. 19-22—National Peach Council annual meeting, Marion Hotel, Little Rock, Ark.—Bob Rogers, Sec'y-Treas., 302 W. Walnut, Carbondale, Ill.

Feb. 23-24—West Virginia State Horticultural Society annual convention, Martinsburg.—Carroll R. Miller, Sec'y, Box 892, Martinsburg.

AMERICAN FRUIT GROWER

WHAT'S SO DIFFERENT

It's not their size, shape or color. It's the fact that each of these powerful Massey-Ferguson Diesels—the 4-plow MF 65 and the 3-plow MF 35—now offers you the most effective combination of power and economy you can get! And here's how they do it . . . First, these tractors are completely designed and built around the Ferguson System—that ingenious system of balanced forces and work-control that's never been equalled for speed, economy and handling ease. The system that transfers horse-power into work-power automatically—with fuel-saving efficiency. Second, both these hustling diesels now feature Massey-Ferguson's own engines. Three and four cylinder diesel engines with the latest swirl-

ABOUT THESE DIESELS?

combustion-chamber design that gets more power out of every ounce of diesel fuel. Engines that helped these tractors score outstanding power and economy records in recent official tests. That's why these diesels are "different." And that's why more and more farmers are turning

to Massey-Ferguson for the biggest, fastest pay-off in modern diesel power! Why not prove it to yourself? Take a free demonstration right on your own place. Time payments are also available if you wish. But don't miss trying one of these tractors—the hottest 3 and 4 plow diesels that ever worked the land—yours from Massey-Ferguson . . . world's largest manufacturer of tractors and self-propelled combines!



See "TODAY ON THE FARM" for the latest farm news, forecasts, music and fun—each Sat. at 7 A.M. on NBC-TV

Fruit growers everywhere agree...



GENITE[®] Miticide
gives best control
of early mites!



TERRIFIC!

"I have used Genite for years with excellent results. The mite control is terrific!"
W. E. Apple,
Oconomowoc, Wisconsin



NO RED MITES SINCE '56!

"Four years ago my prunes were heavily infested with red mites. An early application of Genite cleaned them out. I haven't had a serious buildup of red mite since."

R. H. Williams,
Fruitland, Idaho

From coast to coast, more and more fruit growers are discovering that Allied Chemical's Genite is the mightiest miticide yet—bar none—for early mites. Genite is so effective just one spraying will usually control mites far into summer. You'll need to make fewer late season sprays . . . cut down mite populations so effectively control results will often continue into the following year!

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from coast to coast*



PLYAC[®] Spreader-Sticker
makes sprays stick
better, last longer!



SUPERIOR TO ANY OTHER!

"The performance of Plyac is superior to that of any other spreader-sticker I have used in the past."

John Babcock,
Hartford, Michigan



BEST SPREADER-STICKER I EVER USED!

"Plyac is the best all-around spreader-sticker that I have ever used. I use it for all fruit sprays and it is especially good on plums and prunes."

Maury Clayton,
Marne, Michigan

Plyac, Allied Chemical's new polyethylene spreader-sticker, makes sprays stick better and last longer—even in rain when sprays without Plyac wash off easily. May be added to all wettable powders, sprays and emulsifiable concentrates. Only 2 to 4 ozs. are needed for each 100 gals. of spray mixture. For top money fruit, use Genite for mites and Plyac for longer-lasting spray control!

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

American Fruit Grower

• Fruit for Health •



Long reach on the Garwood's tractor-mounted lift makes it possible to load trucks from one side. Heavy-duty tractor has power steering.

"We Couldn't Do Without It!"

That's what the Garwoods of Indiana say about mechanization—
and they have cut costs in every phase of their orchard operation

By JEROME HULL, JR.

Purdue University, Lafayette, Ind.

REDUCING labor costs while producing and maintaining a high quality, attractive product that will command a profitable price is the goal of most orchardists. The Garwood brothers—Gene, Jim, and Carl—all horticultural graduates of Purdue University, used mechanization and modern local sales methods to accomplish this purpose.

The Garwoods operate 110 acres of fruit plantings in LaPorte County in northwestern Indiana, a fruit-growing area which receives favorable climatic protection from Lake Michigan and yet is near a highly populated area that includes East Chicago, Hammond, Gary, Michigan City, and South Bend.

The majority of the orchard acreage now operated by the Garwood brothers consists of small plantings leased from neighbors. However, they are establishing young plantings on land they own to assure a stable, profitable enterprise.

They operate about 78 acres of mature apple trees, 24 acres of young apple trees, and 8 acres of peaches. About 25,000 bushels of apples constitute a full crop.

One-half of their production is re-

tailed directly to the consumer and the other half marketed through wholesale channels. About half of the fruit marketed through wholesale channels is sold bulk in crates supplied by the buyers. Packed fruit sold through wholesale channels is generally packed in the 4-pound poly bags and master cartons or occasionally in a few tray packs.

The three brothers believe that a profitable private enterprise can be achieved through hard work and long hours. However, they have been faced with rising agricultural labor costs plus the problem of obtaining competent labor. Consequently, they have changed their operations, mechanizing wherever possible as their financial conditions have permitted.

Bulk handling is their greatest labor-saving change. They spent three years planning their bulk-handling method to insure an efficient operation. They took into consideration fork-lift heights, pallet sizes, bulk bin sizes, door sizes, width of working areas, trailer bed sizes, and ceiling heights.

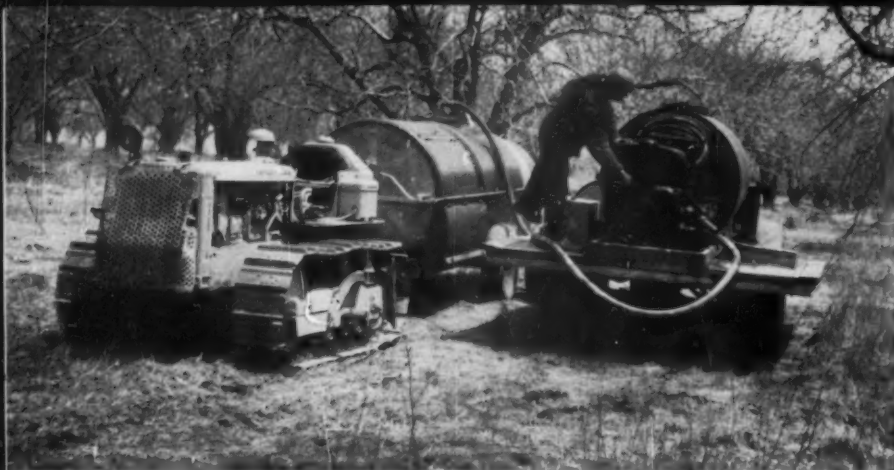
The most important consideration was the fork-lift truck. They purchased a rebuilt industrial model (Tow Motor Corp., S. Chicago, Ill.) with a written guarantee for the first 600 hours of use for about \$2000.

Since the entire bulk handling operation is dependent upon the fork-lift truck, they obtained theirs from a supplier close to their orchard to make repairs more convenient. While it now has a gasoline-powered engine, they intend to convert to L.P. gas when they can afford the additional \$275 required.

Bulk handling also necessitated a tractor-mounted fork lift (Superior Co., Wheeling, Ill.) for field use. Requirements they considered important here were a heavy-duty basic loader to minimize side sway, a high-volume front end hydraulic pump for speedy lifting, a pair of tilt cylinders for the fork, a quick attaching system to make the tractor available for other work, and a back plate on the forks which allows the operator a view of the fork tips when guiding them under pallets. A heavy-duty tractor with power steering was found to be essential when light-duty tractors could not perform the job.

The Garwoods decided that the two-way entry bulk box was the best for their purposes. They purchased industrial wirebound 20-bushel boxes (General Box Co., Louisville, Ky.) at \$10 each in carload lots. Feeling that the nailed bin would not withstand the twisting and beating that

(Continued on page 35)



With tractor-mounted spray rig, truck carrying nurse tank two men can spray 70 acres a day.



Mobile hydrocooler is ready to operate immediately.

The TRACTOR and

Mechanical power has eliminated backbreaking jobs, minimized labor costs, paved the way to efficient production of quality fruit

By C. A. SINE
Associate Editor

ONE frosty morning in the spring of 1902, a gasoline-powered tractor chugged into the orchard pulling a wooden spray tank. Joe Smith jumped down and grabbed a 10-foot spray rod. One of his helpers began to pump and spray material flowed through the nozzle onto the tree. By evening, Joe Smith and his helper were too tired to eat dinner . . . but they had sprayed *one acre* of apples.

Some 60 years later, Joe Smith's grandson, Charlie, climbed aboard his Diesel tractor and pulled a 1500-gallon sprayer into the orchard. His helper followed in a truck carrying a nurse water tank. Charlie sat comfortably on the tractor, operating hydraulic levers. His helper sat comfortably in the truck, ready to bring water when needed. At the end of the day, Charlie and his helper returned home, ready for dinner and an evening of TV. Unlike Grandpa, they had sprayed *70 acres* of apples that day.

The year 1902 marks the beginning of the end of Old Dobbin's reign as the fruit grower's silent partner. Today the tractor and the truck are the grower's partners in power.

The growth in the number of tractors on fruit farms parallels the perfection of the tractor and the intro-

duction of a practical power take-off in 1918; the three-point hitch in 1939; the double clutch in 1947; and power steering in 1956.

Although the truck lagged behind the tractor, first appearing on fruit farms about 1915, it too has become an important part in the operation of today's fruit farm. The development

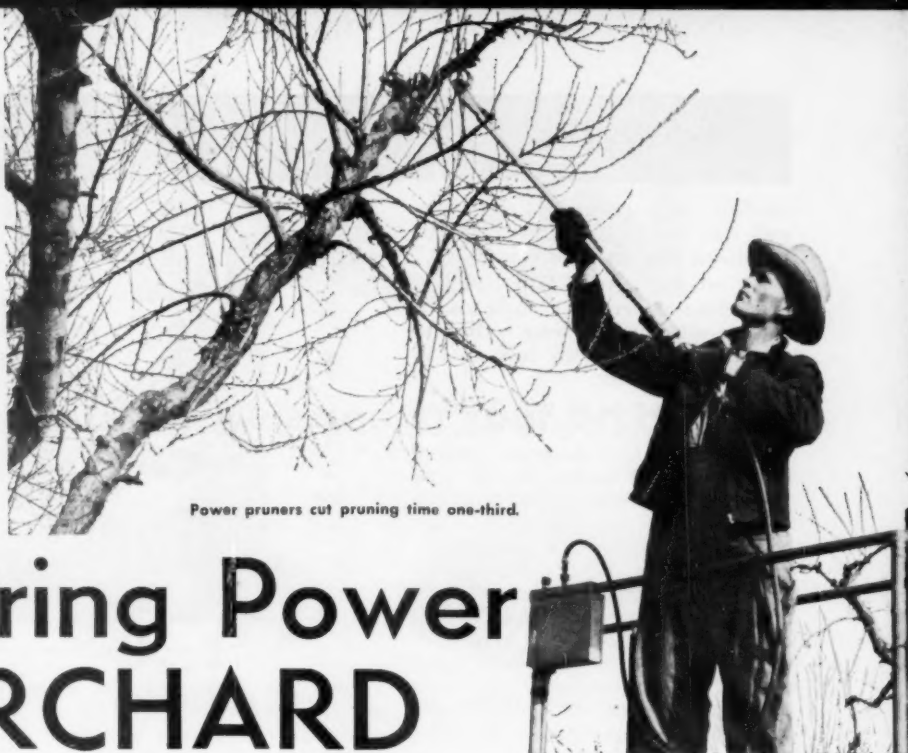
of such features as four-wheel drive; single, double-reduction, two-speed or dual-ratio, underdrive, and overdrive axles; and transmission systems varying from the standard three-speed to eight forward speeds, have made the flat-deck truck, the pick-up truck, the stake truck, and the tank truck indispensable units.



Hydraulically-powered topper saves time, labor. Blades tilt, turn in any direction desired.



reaching location when ice, water are supplied.



Power pruners cut pruning time one-third.

TRUCK Bring Power to the ORCHARD

And the development of a new set of "tools" to use with the tractor and truck has brought the push-button age to the fruit grower's doorstep.

In 1950, there were 76,000 tractors in use on fruit farms in the United States. By 1954, that figure had climbed to 96,000. In 1950, fruit growers owned 70,000 trucks; in 1954, 80,000. While figures are still incomplete, preliminary tabulation of the 1959 Farm Census indicates the number of tractors and trucks on American fruit farms is steadily increasing.

What do the tractor and truck mean to the fruit grower in this push-button age?

To Clark Brownell and his twin brother, Mark, the tractor and truck mean lower labor costs. The Brownells' 300-acre orchard is located at Williamson, Wayne County, N. Y., on the shores of Lake Ontario. The acreage is divided between apples, cherries, peaches, and prunes. Despite the size of their operation, the Brownells have only two full-time employees and one part-time helper.

How are they able to manage with such a minimum of help? Clark Brownell's emphatic answer: "mechanization."

The "muscle" of the Brownell operation is nine tractors—two Ford, two IH 350, an IH 400, an IH 300, a John Deere 60, a Caterpillar, and a IHC. Some of the tractors are rigged for special equipment. For example the Caterpillar is equipped with a bulldozer for tree removal. Four years ago power steering was added



Less than 10 years old, fork-lift attachment is an important part of bulk handling system.

to the IH 300 to facilitate handling of a fork-lift attachment—an implement not available 10 years ago.

"We wanted to start handling our apples for processing in 20-bushel bulk bins," Clark Brownell explained, "and we needed a fork lift to handle them."

Approximate cost of the fork-lift attachment was \$2300 but the Brownells say it paid for itself the first year.

"Before mechanization, we had to handle each bushel twice. With our tractor-mounted fork lift and bulk bins we figure we save two or three man-hours on every 20 bushels

POWER... In the Orchard

handled. This system has worked so well that we're going to handle our processing peaches in bulk next year."

An integral part of bulk handling is the flat-deck truck. It can be loaded and unloaded quickly since both sides of the truck are readily accessible to fork-lift equipment.

A different type of bulk handling is used by neighbors of the Brownell twins, the DeMay brothers, cherry growers in Williamson, N. Y. The red tart cherries are emptied from the picking buckets into tanks filled with cold water. Each tank holds 1000 pounds of cherries. By chilling the fruit as it is harvested the DeMays are able to reduce fruit scald which develops from bruising. A tractor-mounted fork lift moves the filled tanks from the orchard and loads them on a 4-ton flat-deck truck. Eight tanks can be transported to the processor in a single load.

The tractor and a little inventiveness has helped grape grower John Archer, of North East, Pa., to keep experienced workers at pruning time.

"You know, grape vines are pruned during the winter and the cold weather really makes the job rough," Archer said. "So we got the idea of building a shelter for the men as they



By hand two men can plant 10 trees an hour; with tree hole digger, tree a minute.

pruned. We rigged a trailer around our IH 300 tractor. First, adjustable platforms 17 feet long were built on each side of the tractor. Three men can prune from each of these platforms. Then we took metal roofing and covered it with a canvas canopy with Plexiglas windows that extends like a tent over two rows.

"Our IH tractor has a special transmission so it can move at a slow idling speed of 2 or 3 feet a minute,"

(Continued on page 29)



No frosted toes for workers inside grape pruning trailer.



Removing tree stumps is easier with bulldozer.



Chipper converts once-wasted prunings into mulch.



Back up, catch hook, lock in seconds with Insta-Hitch.

ETHION

Gets 'em before they can get started in your orchard



KILLS MITES



KILLS APHIDS



KILLS SCALE

A HIGHLY EFFECTIVE INSECTICIDE-MITICIDE FOR LATE DORMANT APPLICATION IN OIL

Ethion, discovered in the research laboratories of Niagara Chemical Division, Food Machinery and Chemical Corporation, is now being marketed through selected formulators throughout the country. It is an organic phosphate insecticide-miticide. Over four years of field testing have proved ethion to be an economical and effective aid to fruit growers.

ECONOMICAL TO USE

Superior pest control with ethion-oil sprays can be obtained with lesser amounts of oil, thus providing a wider range of safety from oil injury, while increasing insecticidal efficiency.

KILLS OVERWINTERING STAGES

The primary usage for ethion is for late dor-

mant applications in oil on deciduous fruit trees to control overwintering stages of mites, aphids and scale. These pests can be controlled by this application more effectively than with later sprays, thereby giving protection before insect damage occurs. By spraying with ethion in oil during the late dormant period, this job can be done more economically and most effectively at a time of the year when other orchard duties are less demanding.

WHERE TO BUY

Many formulators and their dealers now have ethion-oil in stock. See your supplier now and prepare to take advantage of this most effective spray application.

ETHION is a product of the Technical Chemicals
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Tests at Geneva (N. Y.) Experiment Station with Gould tree shaker indicate red tart cherries can be mechanically harvested for less than 1½ cents per pound without impairing quality.

The BIG Question: Can We HARVEST BY MACHINE?

The answer is "yes" as early users of mechanical harvesters chalk up savings in time and labor. But widespread adoption of the machines must await further developments

By **D. A. KAPLE**
Associate Editor

BACK in January, 1953, AMERICAN FRUIT GROWER published a picture story on the latest developments in orchard machinery which included "mechanical robots" that picked up nuts from the orchard floor. One device swept the nuts into a machine, another type raked them up, and a third sucked them up through huge hoses. The nuts were then collected in field bags or a trailer.

Since 1953 enormous strides have been made in mechanical harvesting. The hand-operated pneumatic tree shakers have been replaced by powerful boom shakers mounted on engine-driven tractors, the nuts are "windrowed" for pickup, and gigantic machines pick them up automatically from the ground, discard leaves and trash, and then shoot the nuts back into a trailer.

Since 1953, too, adaptations of the early machines have been made for harvesting many deciduous tree

fruits and small fruits. More fruits today can be harvested mechanically for processing than fruits that cannot.

But the big question still remains: Can picking machines be developed to harvest bruise-free fruits for fresh market? So far, the only progress has been in mechanizing the harvest of processing fruits where bruising is not a limiting factor.

An ever-increasing demand for mechanical harvesters has been brought about by the growing labor problem. Many growers today realize that they must find a way to harvest their fruit mechanically or they won't be able to harvest it at all. Well aware of the problem, USDA, the state colleges and experiment stations, private industry, and individual growers are exerting every effort to speed up the development of efficient, economical mechanical harvesting machinery.

In California growers are harvesting prunes with shakers and catching frames that do the job at less than half the cost of hand picking. A commercial tractor-mounted boom

shaker and self-propelled catching frame are manufactured by Gould Bros., Inc., San Jose, Calif. Cost of the shaker is about \$2600 and the frame, in two parts that encircle the tree, costs about \$10,000.

Using the Gould equipment, a five-man crew replaced 60 hand pickers on the Sam Zall prune ranch



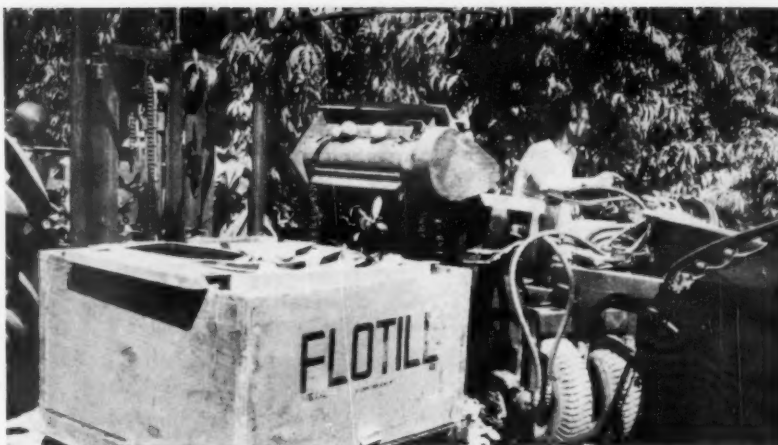
Dave Friday's automatic blueberry harvester, operated by one man, flails berries into lugs.

AMERICAN FRUIT GROWER

in Yuba County, California, during the 1960 season.

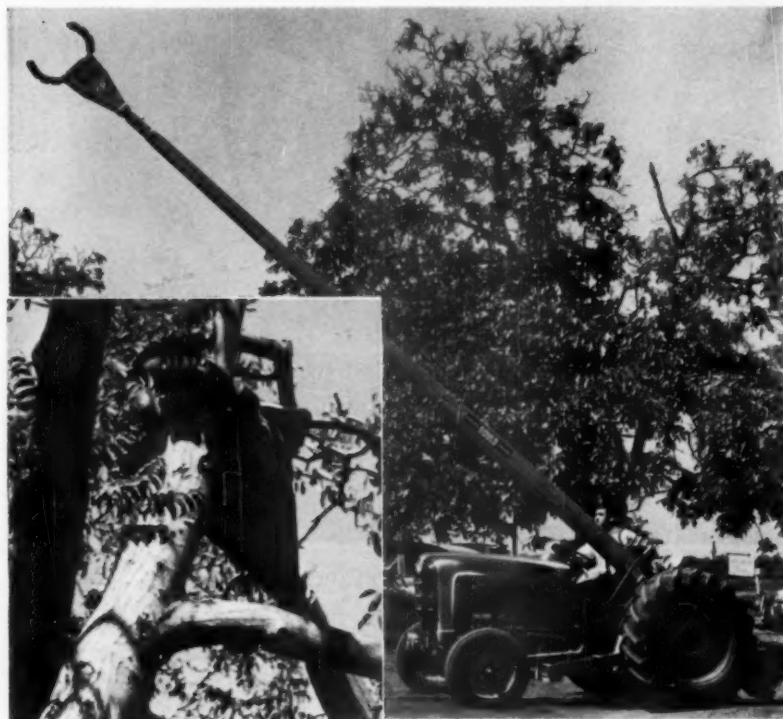
Cling peaches are being harvested in field trials in California with the same type of equipment or with knockers. In a test by University of California researchers, impact knocking guns were used with rubber-padded knocking heads mounted on a standard production Gould catching frame. Four or five well-placed shots from two guns cleaned a tree in two minutes or less.

Another type of rubber-padded knocker mounted on a tricycle-type, self-powered, 20-foot knocking boom was used in 1960 to harvest peaches on the John Sasaki ranch near Marysville, Calif. Peaches were knocked off into a two-part, self-powered catching frame.



F. Leland Elam

Self-powered catching frame used on John Sasaki ranch has seated operator for each half of unit. Conveyor belt and elevator move peaches to bin. Knocking boom is pictured on cover.



Bethlehem Steel

Gould SM-16 tree shaker has 18-foot hydraulically-powered boom which is operated from driver's seat. Inset shows close-up of rubber-encased Bear Hug Claw grasping limb of walnut tree.



USDA Agri. Eng. Res. Div.

Baffled canvas picking chute used to speed up harvest of apples cuts picking time in half.



Air-powered impact knocker is mounted on canvas baffled catching frame which minimizes bruising.

It is estimated that labor costs were cut at least 50%. One man operated the knocker and two men the two-part catching frame, one seated on each unit where there is a complete set of controls.

Apricots were also test harvested successfully with the equipment which is manufactured by A. D. Goodwin & Son, Inc., Manteca, Calif.

These harvesters are being tested and improved each season. A recent advance is the low-profile catching frame with a powered draper developed by USDA, University of

California, and Gould Bros., Inc., to meet the need for a catching frame that matches the capacity of a shaker or knocker.

Frames originally designed for catching prunes are being modified for peaches that bruise more easily. University of California researchers are using three layers of canvas-strip baffles across the length of a frame to reduce mechanical injury as the peaches fall.

Developing shakers that can be mounted on catching frames is a

(Continued on page 28)

Can the TREES Take It?

Shaking the fruit off mechanically doesn't seem to bother the trees too much—but some practices—including pruning—will have to be adjusted

By CLARON O. HESSE
University of California, Davis

CALIFORNIA growers, at least for major portions of that state's tree fruit, nut, and grape acreage, know that mechanical harvesting and bulk handling are already inevitable for some crops and that methods for handling even the most tender of our fruit crops will ultimately be devised. As with any new practice which radically changes established methods, such practices must lead to revolutionary changes in training of trees and their culture.

Probably varieties particularly adapted to better meet these new demands will be needed. The ingenuity of both the engineer and the horticulturist will be called upon. In this article some of the problems of particular interest to the horticulturists are emphasized.

Hundreds of thousands of acres of deciduous tree fruits and vines now standing were planted and brought



Walnut tree has been pruned for mechanical harvesting. Grabs can be made low in head.



Inertia shaker mounted on catching frame shakes tree gently, avoids bark damage

into production with no thought given to the demands of mechanical harvesting. These, to a great extent, are the materials with which the engineer has had to work in devising efficient mechanical harvesting methods. Perhaps relatively little can be done to correct the deficiencies—from a mechanical

harvesting viewpoint—of structure of these mature bearing trees and vines.

In the case of tree fruits, some of the basic problems encountered are an excess of scaffold branches in the area most convenient for the application of the mechanical forces used in shaking. This has resulted from the use

of low-headed trees, the development of a relatively large number of large scaffold branches near the ground, and excessive multiplication of main scaffold limbs by branching at low heights.

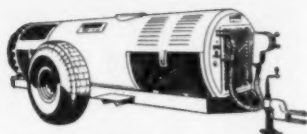
In the case of clingstone peaches, the common practice of California growers in developing long "hangers" has resulted in a type of growth which hangs free, is limber, and from which fruit cannot easily be removed by shaking. Probably not much can be done to make such trees more effective for purposes of mechanical harvesting without an undue loss of fruiting area.

Another factor contributing to the loss of efficiency of mechanical harvesting in some standing, mature orchards results from the heavy foliage cover, which hides the main scaffolds from the operator and makes effective contact difficult. Such factors tend to slow the time of the harvest operation

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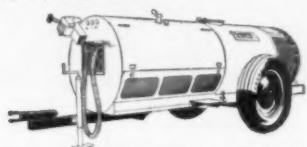


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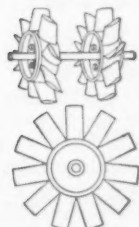
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Perfect for the smaller grower, delivering over 40,000 cubic feet of air per minute.



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and make it less efficient. In spite of these defects in standing orchards, mechanical harvesting appears still to be sufficiently efficient to compete economically with hand harvest methods.

For the grower planting a new orchard, the potentials of mechanical harvesting must certainly be taken into account and will affect his training and tree development practices. Currently these may be summarized as the development of higher trunks, high enough to allow for a single "grab" below the lowest scaffold during the earlier life of the tree, and as few as two or three on main scaffold branches during most of the trees' productive life. Except for the larger fruit trees this method may be effective for the normal life of an orchard.

The trees will be kept more open in the center to allow the fruit to fall free of the trunk crotch where it may be injured in falling, and to have more of the fruit fall away from the trunk where it is more easily collected. For species adapted to the development of "hangers" this type of fruiting wood will probably be eliminated. A general stiffening up of the fruiting wood is highly desirable in transmitting the shaking forces to the fruit attachment.

For grapes, special trellising and training of the vines will be necessary. Current practice is to develop all fruiting wood on one side of the trellis stake over horizontal wires, and develop the canes or fruiting wood in such position that the grapes will hang freely below the wires. This type of training will allow a cutter-bar to remove nearly all bunches with relatively little loss.

Assessment of the relative importance of the problems associated with mechanical harvest is one of the important results of current tests. Hand harvest methods utilize two, three, and often four picking periods to insure proper maturity of the fruit for the purpose for which it was grown. Economical mechanical harvest must obviously reduce the number of picks to one or at the most two.

Though fruit tends to loosen as it reaches maturity, the forces applied in mechanical harvesting cannot be transmitted uniformly to all of the fruits. Therefore selective harvest is not yet feasible. Surprisingly, in most orchards the maturity problem has possibly been not as great as anticipated, although it remains to be satisfactorily solved.

Several methods of attack can be explored in relation to this problem. First, the development of new varieties which inherently ripen more evenly over the tree. Second, varieties which show a greater differential

in the tightness of the fruit near maturity. Third, the development of pruning and training methods listed above. And finally, changes in cultural practices, especially those which will reduce the extremely vigorous growth found in many of our deciduous orchards at present, thereby opening up the trees and giving more uniform maturity.

Damage to fruit harvested by shaking is associated with the fruit striking branches in its fall to the ground or catching frame, damage upon contact with the catching surface, and damage associated with its collection. The smaller, lighter fruits have proved to be less subject to damage at all points, as might be expected. The heavier fruits are more likely to be subject to damage from these causes.

When adequate precautions are taken, damage from these sources is relatively little. Tree structure is important because some of the most severe damage to the fruit occurs in striking limbs. The training and pruning programs suggested earlier will help to minimize this particular problem.

For fruit to be caught on catching frames, baffles are used to break the fall of the fruit. Removing the fruit from the catching frame should not result in damage. Where fruit is to be shaken to a soil surface and later picked up, the preparation of a smooth soil surface is all important, as has been re-emphasized many times in California.

A second type of damage is that inflicted up the tree itself. The old cable shakers, which required considerable tension to be put upon limbs, were a serious source of damage, not only to branches but to roots. The newer shakers and knockers have practically eliminated this hazard.

Shaking has been observed in young prune orchards where "grabs" were made below the trunk crotch and the tree shaken quite vigorously. Under such extreme conditions damage below ground might be expected, but continued observations in these orchards have revealed no indication of root damage.

Damage to limb bark from shaker and knocker heads has been observed many times. A good operator will certainly minimize this. The problem is usually associated with angular placement of the shaker or knocker head, which transmits the shaking force at a rather large angle from the perpendicular to the branch.

In the past, California growers have commonly used large rubber mallets in knocking almonds and prunes to the ground in the normal hand harvest. De Vay, of University of California's plant pathology de-

partment, has shown in the case of almonds that knocker heads inflict less damage to almond limbs than the hand rubber mallets. Certainly limb damage will be negligible with the inertia shaker pictured here.

Most of the inconveniences associated with catching frames have been overcome with the development of the low profile frame. This motorized frame provides an acceptable surface for the catching of tender fruit, and provides a mounting for shaking implements.

Relatively little has been said about pick-up machines. Satisfactory pick-up machines for nut crops have been used for many years in California. Historically, prunes have been brought to the ground and picked up by hand. The pick-up machines adapted to walnuts have not been satisfactory in the harvest of prunes, especially when soil preparation was not perfect.

The new principles involved in the University of California-USDA pick-up machine and its several commercial modifications have largely overcome the disadvantages of the large, wide-swath nut pick-up machines. Damage from the pick-up element is negligible.

It has been discovered that bulk handling of our fresh fruits and nuts results in most cases in less damage than occurred in the box handling methods. Grapes for wine have long been handled in large quantities in gondola trailers. Mechanization of the laying of grapes for making raisins is accomplished by the same machine which bears the cutter-bar being developed for mechanical harvest.

It is apparent that a variety of methods and combinations of methods may be adopted by the growers of several of our tree fruit and nut crops to partially or completely mechanize their harvest operations. The growers will adopt those methods which seem to fit their overall operation best. Certainly growers establishing new orchards and vineyards will give serious consideration to the training and pruning of trees to simplify mechanical harvesting.

Cultural operations will change, new varieties will be developed, and many practices will be modified to enable the most efficient use of mechanical principles. Each improvement will tend to reduce the losses inherent in a non-selective, extremely rapid, but highly efficient harvest procedure.

It now appears that several tree and vine harvests can be effectively mechanized without extreme modification of growing practices. But some changes are certainly indicated, especially in training, pruning, and culture, and probably eventually in varieties.

THE END.

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"Can I Afford to HARVEST by MACHINE?"

That's a question growers are asking as they look forward to solving the hand-harvest problem by mechanical means

By M. E. CRAVENS

Ohio State University, Columbus

THE fruit industry is one in which long term planning and investment are necessary. What you do today in planning and planting and building will affect your profits 10 to 50 years from now.

It is not too early to start planning for mechanical harvest. What are some of the pitfalls that are likely for the unwary or unwise planner as a result of mechanized harvesting? How does it fit into other trends in the fruit industry?

The major reason for the interest in developing mechanical harvest is the increasingly high cost and relative inflexibility of harvest labor. Harvest labor costs sometimes amount to over half the price received by the grower and for every fruit they are a significant cost factor. In every way the harvest period is a critical one for the fruit and for the fruit grower.

In the first place, the effect of mechanized harvesting will be different for each type of fruit and different for the fruit that goes to the fresh market than for that which is processed. It is easier to mechanize the harvest of fruit for processing, where the fruit will be quickly used, than for the fresh market where a considerable storage and marketing period is usual.

But, the relative advantages and disadvantages of new techniques are constantly changing. Most of the present harvesters operate by shaking the fruit from the tree or vine and a considerable amount of damage to the fruit occurs. In the future, the amount of damage will be reduced as new or improved methods are developed.

Investment in harvesting equipment will tie up capital and add to fixed costs and the grower with lim-



This grape harvester developed at Cornell University, Ithaca, N. Y., can do the work of about 25 men by harvesting 3 to 5 tons of grapes in an hour. Researchers hope it will reduce harvesting costs which now amount to about 46% of the expenses in grape production.

ited capital will be at a still greater disadvantage than at present. Somehow he must finance not only the mechanical harvester but also the hauling and handling equipment that is required for its effective use. One alternative is custom harvesting for the small or the underfinanced operator, but the producer with his own equipment can usually do a more satisfactory and timely job.

Another important management need will be obtaining high yields per bush or tree. While hand harvest is usually on a per bushel or unit basis, mechanical harvest will require much the same time per tree regardless of the amount of fruit produced.

Mechanical harvesting will affect both those who do and those who do not adopt it. For instance, if this method is adopted by cherry growers

or even growers of fruits that compete with cherries, the grower who does not adopt it will be at a disadvantage. The degree of his disadvantage will be determined by how effectively his competitors use the new and more efficient method.

Any new machine that will replace an old machine and do a better job or that will do a job that was previously a hand operation increases the size of orchard that is most efficient. It is inevitable that the mechanical harvest of fruit will give a further advantage to larger units of production. This will be true even though each unit of the harvest equipment might handle only a relatively small acreage.

Most machinery performs better on level than on steeply sloping terrain. The mechanical harvester, together

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with the bulk handling equipment required to realize the full advantage of the mechanical harvesting of tree fruits, performs best on level land.

The variety or type of fruit that is less easily damaged will be most readily adapted to machine harvest. This may give an added advantage to the blueberry over the raspberry, for instance. On the other hand, it appears more feasible to develop a harvester for raspberries than for strawberries.

Another varietal characteristic that will be desirable is that of uniformity in fruit maturity on a tree. Even in fruits where only the mature fruit is easily shaken off, there is an advantage in having fewer harvests.

The plant breeder and the plant physiologist will be key persons in the development of successful mechanical harvesting. Without the judgment of the individual picker, uniform maturity and good judgment regarding the maturity of the fruit on the tree become even more crucial.

The advantage of the dwarf over the regular size tree will probably be greater in mechanical than in hand harvest, especially where fruit damage is a factor.

The entire training of the tree must be tailored to harvest efficiency as well as to efficiency for spraying and for obtaining fruit color and quality. Attention to the compactness of the fruit bearing area and to the adaption of the particular needs of the harvest equipment will aid in its effective use. This may require more skill and time in the special training of the tree or vine.

In most cases the amount of sorting and grading will be increased by mechanical harvest. One reason for this is the necessity for harvesting all the fruit that will shake off the plant at one time. Another is the almost inevitably greater mechanical damage to the fruit. Still another is the fact that the sorting now done while picking will be left to the grading and packing operation. The grading lines will also have to take care of more leaves and other extraneous matter.

Because of the problem of disposing of "off grade" fruit the area with concentrated production will have an added advantage over the one with widely scattered production.

The immediate effect of mechanical harvest for most tree fruits will probably be a slight decrease in marketable fruit harvested per acre. This may result in a smaller supply and a slightly higher price per pound or bushel when mechanical harvest first is used. This may mean that mechanically harvested fruits will show a short term increase in profitability even for growers who do not adopt this method.

In the longer run, plantings will increase in response to the increased profits, and with the increased production, prices will decline. At this stage, the growers who have not adopted the improved harvesting method will be less well off than today. Some of the those who cannot or will not adopt the new method of harvesting will be forced out of business.

For some fruits, such as blueberries, mechanical harvest may increase the amount of fruit harvested. Today, much fruit is left unharvested towards the end of the harvest because of the high cost of hand harvest.

The greatest advantage will go to the grower who adopts the new and improved method and who plans and plants the added acreage of the type of fruit necessary for its efficient use.

Advantages of mechanical harvesting will be greater for the processed than for fresh market fruit. Of two fruits the new harvest method will improve the competitive advantage of the one that is the more suitable for processing.

And, as usual, the consumer will be the principal long term gainer through having more of the product to eat at a lower price.

Mechanical harvesting, then, appears to favor:

- 1) Medium to large fruit plantings for both the picking operation and the bulk handling equipment that will be required to mechanize the entire harvest operation.

- 2) Continuous rows or blocks of fruit. (Although present fruit harvesters do not generally harvest the crop in the same fashion as does the grain harvester, continuity within a row will make for more efficient use of the equipment.)

- 3) Relatively compact fruiting and possibly special pruning methods for trees, vines, etc.

- 4) Relatively firm fruit that is not easily damaged.

- 5) Uniformity in ripening of fruit on one tree or plant.

- 6) Reasonably level land.

- 7) Large concentration of fruit nearby so that there will be a large enough quantity of the overripe, underripe, and damaged fruit for effective utilization of these "off grades" in appropriate processed items.

- 8) High yields per bush or tree. Hand harvest is commonly paid for on a per bushel or per pound rate. Mechanical harvest will require much the same time per tree regardless of the yield so that the cost per bushel will be cut by higher yields. THE END.

THE QUESTION BOX

Don't be perplexed! Send us your questions—no matter how big or small. A 4-cent stamp will bring you an early reply. Address: The Question Box, AMERICAN FRUIT GROWER, Willoughby, Ohio.

COPPER COIL FOR COOLING CIDER?

Recently a client of mine who runs a roadside stand asked if he could cool cider in the barrel, since he has a lot of customers who prefer to buy it that way. I'm a refrigeration man, but I've never worked with cider. I told him I could put a cooling coil in the barrel but would need to check on which metals were safe to use. I'd like to use copper if it won't damage the cider. Can you give me some advice?—Ohio.

The only really acceptable metal is stainless steel. Copper can have an undesirable effect on cider. The second choice metal would be aluminum.

For best results, the cider should be in stainless steel barrels with removable tops to allow for thorough cleaning after each use. The trouble with wooden barrels is that they cannot be properly cleaned.

If your client has a refrigerated room he could cool and store the barrel in this room. If he doesn't, the cooling coil idea could be used.

NEEDS FROST ALARM INDICATOR

Is there some sort of device which will set off a buzzer or something similar when freezing temperatures threaten.—Pennsylvania.

What you need is a frost alarm indicator, available from Minneapolis-Honeywell Regulator Co., 2747 Fourth Ave. South, Minneapolis, Minn.; Precision Thermometer and Instrument Co., 1433 Brandywine St., Philadelphia 30, Pa.; or Taylor Instrument Co., Ames St., Rochester 1, N.Y.

WHAT AND WHEN TO PRUNE

How much should I cut out of my bearing apple trees, and when is the best time to prune them?—Michigan.

Although light pruning can be done any time while trees are dormant and temperatures are above freezing, it is nevertheless best to wait until after late January because of the possibility of winter injury. Large cuts, such as limbs over 2 inches thick, should be left for late February or March pruning to avoid any low temperature injury to the area around pruning wounds, as well as to whole trees.

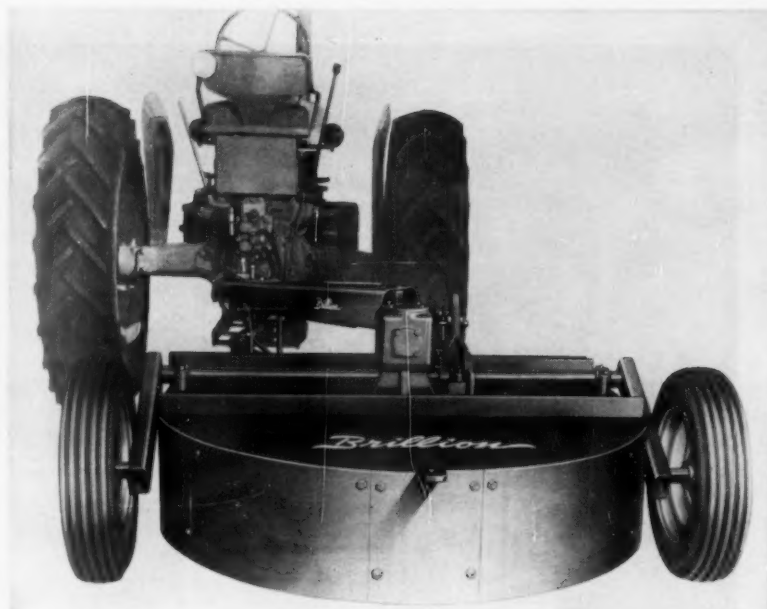
Tall trees may be pruned to a desired height, such as 15 to 18 feet. Low hanging branches and broken limbs should be cut out. From there on, pruning is primarily a branch thinning process. Cut off the rather long, slender, and unfruitful branches which grow mostly downward in the heavier shaded portions of the tree. Watersprouts should also be removed from the inside of the tree, as well as cross branches that might interfere with spray materials or sunlight penetrating to the center of the tree.

FUTURE MEMBER?

What is the address of Dwarf Fruit Tree Association?—Michigan.

Write R. F. Carlson, Secretary-Treasurer, Dwarf Fruit Tree Association, Department of Horticulture, Michigan State University, East Lansing, Mich.

JANUARY, 1961



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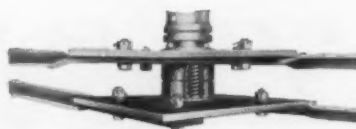
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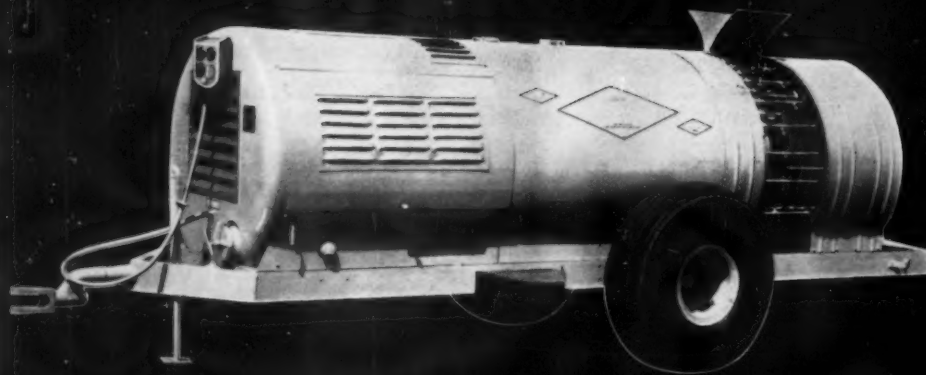
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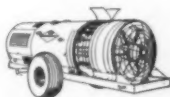
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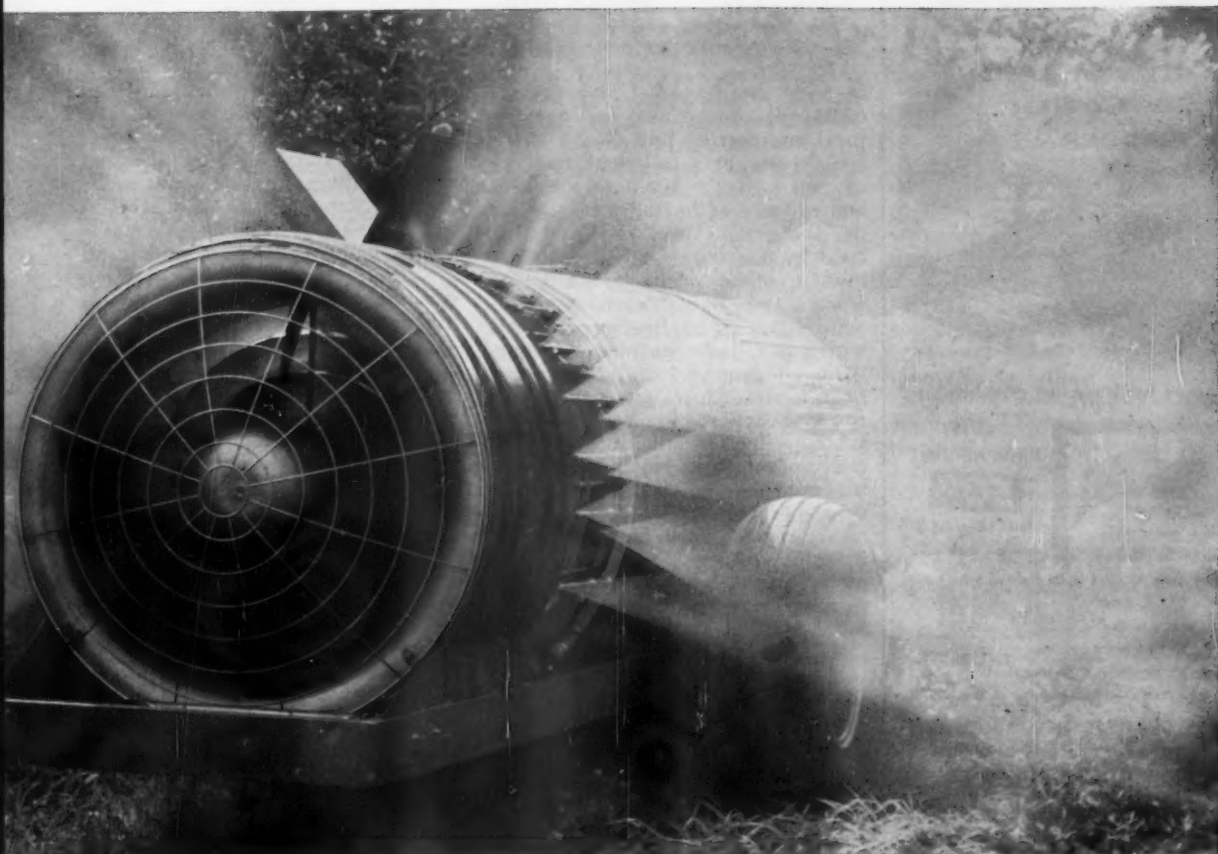
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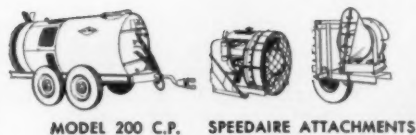


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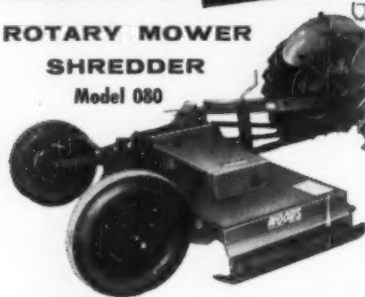
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HARVEST BY MACHINE

(Continued from page 17)

current project of University of California department of agricultural engineering and Gould Bros., Inc. Researchers feel that this type of unit will 1) eliminate the need and expense of having a tractor for the shaker, 2) speed up harvesting time by making it possible to use more than one shaker on a set of frames, and 3) provide easier maneuverability, especially in orchards with many limbs and dense foliage.

In addition to engineering improvements, efforts are being made to adapt orchards to mechanical harvesting. For example, in the future cling peach trees may be headed higher with a more open-tree structure because with their present structure too much fruit is bruised in falling through the trees. Also, main scaffold limbs may be reduced to three for great efficiency in shaking.

In Michigan and New York boom shakers and catching frames are being tested on red tart cherry trees. Results of trials with the harvester developed by Michigan State University and USDA indicate that cherries can be harvested with the machine at half the cost of hand picking.

About 12 Michigan cherry growers have used these experimental commercial machines. All reported reduction in labor costs. It is estimated that a crew of seven using the mechanical picker can do the work of 33 hand pickers.

Stanley prunes were also harvested successfully with the cherry machine in experiments at Michigan State University. About 51 bushels were harvested in one hour. However, attempts to harvest Damson plums mechanically were discontinued when too many fruit spurs were separated with the fruit.

Many growers may find that their cherry orchards need adapting for mechanical harvesting. It is important to have a reasonably level orchard with adequate clearance beneath trees for the harvester. Limbs to be shaken should be visible to the operator of the harvester and branches which cannot be shaken from one direction to another should be removed. Ideally, the number of branches to be shaken should be reduced to three or four.

Development of a grape harvester at Cornell University, Ithaca, N. Y., has been underway since 1957. The machine shakes the grapes off the vines onto a conveyor belt which carries the grapes to a container in the rear of the machine.

This past season, the grape harvester did the work of more than 25 men by harvesting about one acre of grapes, or about 3 to 5 tons, in an hour. A single-wire trellis is used to accommodate the machine.

In California a machine, being perfected to harvest wine grapes and raisins, requires that a special trellis be used. Reports are that more efficient harvesting would result if the grapes had longer stems and in all probability breeders will develop varieties with longer stems to meet this need.

Washington State University and USDA have conducted time studies on an apple harvesting device that shows unusual promise. By picking from a Steel Squirrel and dropping the apples into a baffled canvas tube leading to a bin on the ground a picker can almost double his output.

Dave Friday, of Hartford, Mich., is adapting his apple orchards and apple trees for future machine harvesting. He and his son got the idea of hedgerow planting while observing automatic hedging machines being used on citrus trees in Florida.

Now Friday has an orchard of two-year-old standard apple trees planted 12 feet apart in 18-foot rows. He expects that trees in each row will merge into a solid wall and that it will be possible to use a hedging machine to maintain them in hedges 3 to 4 feet wide and 14 feet high.

Next step will be an apple picking machine which he feels would be more feasible on the apple wall than on conventional apple trees. One way to speed up harvesting in the meantime would be an assembly line of pickers conveyed on wagons along the length of the apple wall.

Friday already has built an automatic hedging machine for a Michigan raspberry grower. He is working, too, with Michigan State University and USDA on breeding strawberries that will be firm and that will ripen uniformly in order to adapt them to machine harvesting. A continuous blueberry harvester, which Friday invented, is in the developmental stage.

Another method of harvesting blueberries mechanically has been field tested in co-operative studies by Michigan State University and USDA. It was found that blueberries can be separated from the plant five to 10 times faster by portable electric vibrators than by hand.

The berries were collected in inexpensive wheel-mounted cloth-covered frames rolled from bush to bush and then passed through an air-blast cleaner to remove foreign matter.

About 50 Michigan blueberry growers have used this experimental

equipment and estimates are that harvesting costs were reduced about 50%. The hand-held vibrators enable a worker to harvest 20 to 30 lugs a day as compared to 3 lugs without a vibrator.

Despite the progress that has been made in the mechanical harvesting of processing fruits, there are still many obstacles to be overcome. Orchard floors are frequently not level enough for efficient operation of harvesters, especially on rolling lands.

Sometimes trees are not widely enough spaced for free movement of the harvesting equipment through the orchards. Also, branches are often too low and closely spaced, which impedes efficiency in attaching the shaking device and maneuvering the equipment.

Perhaps the most serious drawback to using the present shakers and knockers is damage to the trees. Wounds are frequently caused by shaking claws and knocking heads. Some of this injury may be severe enough to cause permanent damage.

Fruit being bruised in falling by striking limbs and metal parts of the catching frames is another difficulty.

Research is continuing in an effort to solve these problems and to find

ways to eliminate the extra processing work caused by leaves, twigs, and defective fruit coming off during the harvesting operation. Another problem, especially with small fruits, is to develop varieties that will be firm and ripen uniformly. In the case of California grapes, longer stems would make machine harvesting easier.

But the biggest challenge that scientists face is the mechanical harvesting of fruits for fresh market. As the labor problem increases, ways will have to be found to meet this challenge or fresh fruits may become as scarce as the nickel cup of coffee and the 25-cent haircut.

TRACTOR AND TRUCK

(Continued from page 14)

Archer continued. "And a hydraulic motor regulates the steering mechanism so we don't need a driver."

"The pruning shed cost about \$700 to build but we think it was a good investment. The tractor motor generates enough heat to keep the men warm and the pruning job is a lot easier. We even have a radio to relieve the monotony."

To most fruit growers, the words tractor and truck are synonymous

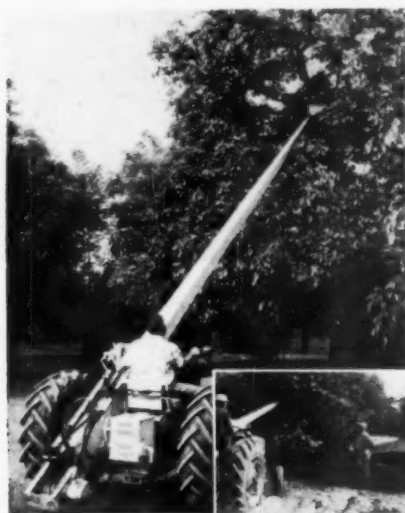
with reduced labor costs. But Charles Pruess, a peach grower with 150 acres in Clovis, Calif., points out a hidden advantage of mechanization.

"Did you know compensation insurance is higher in agriculture than in any other industry? We've had quite a few accidents in the past involving ladders, particularly when inexperienced help has used them. Now we're able to cut down on ladder usage by mechanizing some of our operations, such as pruning. And at the same time, we're reducing our insurance costs."

Pruess recently built a hydraulic orchard platform. The tractor-attached platform has arms that extend around the tree to give the worker more mobility. Pruess said the platform will not only eliminate ladders, but will cut pruning time about 25%.

This peach grower believes that saying labor oftentimes is not the most important reason for mechanizing an operation. Disking prunings into the ground is a job that uses up a lot of physical energy—especially when brush is unusually heavy. Today with his Olson Roto Beater Pruess incorporates the shredded prunings into the soil evenly and with the greatest of ease.

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PHOTO AT LEFT: Gould Hydraulic Boom Shaker operating in walnuts. Inset shows Shaker being used in sour cherries. TWO PHOTOS BELOW: Photo at left shows rear of self-propelled Gould Catching Frames being used in prunes. Photo at right shows opposite end of Low Profile Frame in prunes.



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one season. Send to:

KEL INSTRUMENTS CO., Inc.
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New Brunswick, New Jersey

the land leveler—a 20-foot drag
pulled by tractor to level ground that
has been furrow irrigated. A smooth
surface in the orchard is necessary
for efficient equipment operation.

Ozzie Herkner, Jr., a sweet and
red tart cherry grower in Traverse
City, Mich., has also used a "land
leveler"—but for a different reason.

"The most suitable location on my
farm from the standpoint of elevation
and air drainage was a 27-acre plot
of rough pasture land. But with a
bulldozer we were able to smooth the
land so we can now pull a loaded
sprayer by wheel tractor over the
steepest portion of the slope."

Clark Brownell once listed what he
thought were the basic tools for ef-
ficient orchard operation. He named
the tractor, spray rig, power pruners,
and cultivating equipment. In com-
plete agreement with this idea is Ray-
mond Reiter, assistant manager of
Treesdale Farms, Inc., Mars, Pa. He
has not one but seven spray rigs—five
Bean Speed Sprayers and two Bean
high-pressure sprayers.

Using the five Speed Sprayers and
five nurse tanks mounted on trucks,
Reiter can cover 600 acres of bearing
apple trees in 30 hours. Each sprayer
can apply 1500 gallons per hour.

Being located right in the steel mill
district of the Keystone state, Reiter
has found that mechanization means
survival. Labor in this area is prob-
ably higher than in any other area in
this country.

To operate the 1900-acre farm, of
which 750 acres are in orchard, he has
12 tractors (three D-2 Caterpillar,
three Ford, one IH 650 Diesel, an
IH 400, and four Farnall Super M)
and 15 trucks (two Diamond-T, two
Chevrolet, six IH, and five Ford).

Five of the trucks are used for
hauling fruit to market, three are used
by foremen, and the remaining seven
are used in orchard operations. Like
most fruit growers, Reiter's truck
usage varies from hauling fruit from
the orchard to carrying cover crop
seed to running errands in town.

Another of Brownell's basic "tools"
used by Reiter are power pruners. He
has three sets of Miller-Robinson
pneumatic pruners, each with four
heads. Three tractors are used to
mount compressors for the units.

"We start to use power pruners
when the tree is about eight years
old," Reiter said. "We figure that
four men can prune one-third more
acres a day using power pruners."

Mechanization has not yet solved
entirely all the fruit grower's prob-
lems in his efforts to produce quality
fruit at the least expense. Francis
Crane, an apple and pear grower in
Brewster, Wash., has been quick to
use mechanized equipment, but he has
found through experience that some

operations can still be performed
more efficiently by hand.

"Blossom spray thinning is one of
our major cultural practices. We have
found hand spraying by experienced
personnel is more effective. With air-
blast equipment, particularly on
Golden Delicious, there is a tendency
for the trees to be adequately thinned
at the bottom but under-thinned at
the top. In the case of air-blast
sprayed Red Delicious, there is a ten-
dency to overthin low shaded areas of
the tree due to less vigor there and
proximity to the nozzles. On the other
hand, by using spray guns you can
direct your material where it is needed
and in the quantity needed."

Crane has eagerly adopted many
laborsaving devices, including the
Trump tree hoe.

"The difference in time and labor
is fantastic. When you're using a
hand hoe, the work seems unending.
With the tree hoe you can just sit and
drive the tractor, and let the hoe do
all the work."

An often overlooked benefit of
mechanization is better handling of
fruit. At the Crane orchard, bulk bins
(22½ x 46½ x 46½-inch inside
measurement) are used. Using the
bulk bins and Edwards tractor-
mounted fork lifts, each driver does
the work three men formerly did. In
addition to saving labor, bulk bins
have cut down handling of the fruit,
reducing bruising.

Although he has not adopted bulk
handling, Mason McConnell, an apple
and peach grower in Ravenna, Ohio,
has palletized his operations.

"We mount our regular orchard
crates on pallets. Using a Michigan
Orchard Supply fork-lift truck, one
man can do the work of five or six.
The system more than paid for itself
the first year."

Another "tool" McConnell has
added is a Danuser tree-hole digger.
The digger works on power take-off.

"Two men can plant a tree a min-
ute using the tree-hole digger," Mc-
Connell pointed out. "Digging by
hand, two men might be able to plant
10 trees in an hour."

The push-button era is here. It is
represented by the planting of a tree
a minute to the spraying of 600 acres
in 30 hours—all dependent on tractor
and truck power. As the labor crisis
increases and costs continue to rise,
it is logical to assume that the tempo
of fruit growing will increase, pre-
senting an even greater challenge to
the fruit grower and to the industries
which serve him.

THE END.

For additional information about the Danuser
tree hole digger contact Danuser Machine Co., Ful-
ton, Mo.; Michigan Orchard Supply fork lift truck,
Michigan Orchard Supply Company, Box 231,
South Haven, Mich.; Miller-Robinson power prun-
ers, Miller-Robinson Co., 7007 Avalon Blvd., Los
Angeles 3, Calif.; Olson Roto-Beater, Parma, Inc.,
Parma, Idaho; Trump tree hoe, Trump Sales Ltd.,
Box 160, Oliver, B.C., Canada.

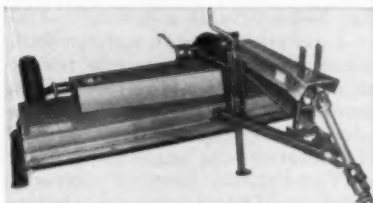
AMERICAN FRUIT GROWER

CUT THEM IN A JIFFY

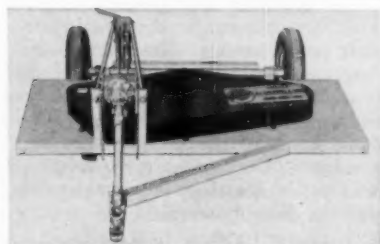
Use mechanical power to shred brush
and prunings easily and quickly



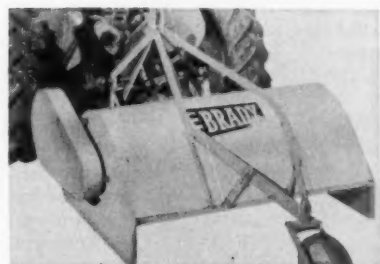
Cut full 90-inch swath with John Deere 527 Gyramor rotary cutter. Gyramor shreds prunings into mulch. Offset model allows clearance close to trunk. Deere & Company, Moline, Ill.



Heavy-duty twin blades of Wood's Offset Model 080 cuts 6½-foot path, takes on branches up to 3 inches in diameter and shreds them into mulch. Wood Bros. Mfg. Co., Oregon, Ill.



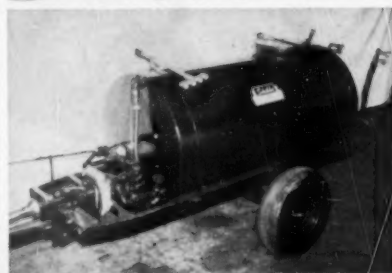
Caldwell's Offset Elco cleans up and shreds prunings even under overhanging limbs close to trunks of trees. Machine cuts 90-inch swath. E. L. Caldwell & Son, Corpus Christi, Tex.



Flail-type Brady Chopper clears orchard floor of prunings and chops them into residue that is readily returned to the soil as humus. Brady Manufacturing Corp., Des Moines, Iowa.

JANUARY, 1961

Skibbe PRESSURE SPRAYER



Big sprayer performance
at low cost.

Pictured 200 gallon model, 20 gpm pump (500 lbs. — 8 pistons) features plastic lined tank, mechanical agitation and is extremely simple and maneuverable. Other model sizes: 15, 25, 50, 100 gallon with pump capacity 5 to 11 gpm.

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700 x 17	6 Ply	12.00
750 x 18	8 Ply	15.00
600 x 20	6 Ply	12.00
650 x 20	8 Ply	12.00
750 x 20	10 Ply	17.50
825 x 20	10 Ply	20.00
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750 x 20	8 Ply	37.50
825 x 20	10 Ply	57.50
900 x 20	10 Ply	62.50

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825x20	10 ply 1st	\$59.50
900x20	10 ply 1st	69.75
1000x20	12 ply 1st	88.00
750x15	6 ply 1st	24.50
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Willoughby, Ohio



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Willoughby, Ohio

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Clears Fields
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By HENRY BAILEY STEVENS

It's Not Just California

THE threat posed by orchard picketing is not growing less serious in the opinion of men on the firing line. Cecil Clark, of Wapato, Wash., suggests that our article in the December issue might well be the beginning of a series on the subject.

"My only criticism is that it may not sound the alarm enough to alert growers who think this is only going to happen in California."

Mr. Clark, who is an experienced legislator, declares it essential to have an act defining agricultural labor disputes and setting up rules governing their handling.

"Perishables just will not stand strikes and fact-finding procedures such as have been developed for other industry."

The Secretary of Labor, not having been able to regulate farm labor by legislation, is attempting to regulate it by edict, says John F. Watson, secretary of Virginia State Horticultural Society.

"The strikes in California causing the loss of cherry and pear crops seem a part of the same attempt to subdue the farmer. Most growers here feel that the American farmer has not yet begun to fight. We are going to have this topic on our annual meeting program January 31st."

Experiences in Tennessee

"THERE is no question about the seriousness of labor's efforts to control orchard employment," writes A. N. Pratt, of Tennessee's State Division of Plant Industry.

"It is obvious that this is merely a step toward control of all agricultural labor. As one who has bucked an orchard strike—when half of our 20-man crew on top hourly farm wages dropped out at the start of harvest of 3000 Transparent trees because we insisted on their using picking tickets—I know something of this problem.

"I've been through the wringer too at the market and piers when our truck drivers watched union laborers take over the unloading.

"Being on the southern edge of commercial apple production we have very few large orchards (over 40 acres). Most of the smaller ones can

get sufficient labor since their diversification helps steady the demand.

"About the only concession I have noted was made by our largest apple grower (350 acres) putting most jobs on a piece-work basis. Even in pruning the foreman checks each tree as completed and punches the card for the pair of pruners.

"Our larger orchards, which mainly produce summer varieties, are in the cotton areas of west Tennessee where quotas and mechanical pickers have left a fair supply of labor available for harvest.

"Some growers who are dependent on local labor are encouraging the better workers by replacing the typical share-cropper tenant shacks with more substantial homes. Bonuses of some sort are doubtless being paid their best help.

"Our larger peach orchards (300 to 400 acres) suffered so much from market gluts and labor shortages, due to the short harvest period for Elbertas and Bracketts, that they passed away in the '40's. Few now exceed 50 acres and are planted to varieties with almost the full six- to eight-week range of maturity. This spreads the harvest labor demand and enables the grower to offer firm tree-ripe fruit for freezers in our larger towns.

"Where labor shortage becomes critical, our Department of Labor arranges for truck transportation of pickers. In some instances, the grower resorts to UpickM harvesting; our largest acreage depends solely on this method.

"So you see our situation is still favorable, although the quality of labor is deplorable. The shift to air-blast sprayers has relieved us of the most troublesome production-labor problem, at least for the larger operators. Some of the smaller ones may be forced to co-operate or fold up. Interest in dusting is considerable, even on difficult terrain.

"I concur 100% with your stand in Windfalls and know that it's high time for growers to take action."

We hope to print reports from other states on the perils of the Picket Fence in later issues. In the meantime, it is clear that this is a problem that cuts across all orchard commodity lines. Migrant labor moves up the West Coast from one harvest to another, not discriminating as to whether it concerns citrus, cherry, apple, pear, peach, apricot, or walnut.

The producer's concern for his particular commodity is not shared by the Agricultural Workers Organizing Committee. All orchard growers are in this boat together.

Address your "Windfalls" contributions to Henry Bailey Stevens, AMERICAN FRUIT GROWER, Willoughby, Ohio.

AMERICAN FRUIT GROWER

COULDN'T DO WITHOUT IT

(Continued from page 11)

the box undergoes, they chose wire-bound bins with 4x4-inch base runners. The bulk bins have outside dimensions of 41x47 inches with an inside depth of 26 inches which facilitates one man nesting them together in bundles of three.

To insure a steady stream of fruit flowing through their grader (Tew Mfg. Corp., Fairport, N.Y.), Jim, who is responsible for equipment maintenance, designed their bulk bin dumper so the bulk bins are placed on a roller conveyor and can be speedily moved onto the dumper after the preceding bin is emptied onto the grader belt.

Gene Garwood, who keeps the orchard records, figures their bulk handling operation saved them \$1100 their first year in direct cost as compared to their previous handling methods. They saved labor by eliminating two three-man hauling and stacking crews.

One picker now spends about a third of his time hauling in loads and returning to the orchard with empty bulk bins. One full-time laborer for leveling crates was eliminated. A 120-bushel trailer load of apples is unloaded in less than three minutes. One thousand bushels of apples, placed in front of a refrigeration blower unit for rapid field heat removal, can be restacked into permanent storage position in about 35 minutes by one man.

About two men are eliminated in the winter packing operations. Also eliminated was part of their repair problem formerly encountered with field crates.

In addition to direct savings, Gene indicates they have encountered some indirect savings, such as a greater percentage of their crop now grading U. S. No. 1 or better. He believes they have 60% less culls from bruising through the use of bulk bins. Because bulk bins enabled operating with smaller labor crews, they were

able to eliminate their poorest help, thus receiving greater return for each dollar spent for labor.

Another laborsaving operation the Garwoods have recently adopted is electric pruning. Their outfit (Home-lite, Port Chester, N.Y.), which cost roughly \$800, consists of a generator, a 4-foot pruner, a 6-foot pruner, and a 14-inch electric chain saw. Pruning 60 acres with this equipment required only one new spark plug and two new saw blades.

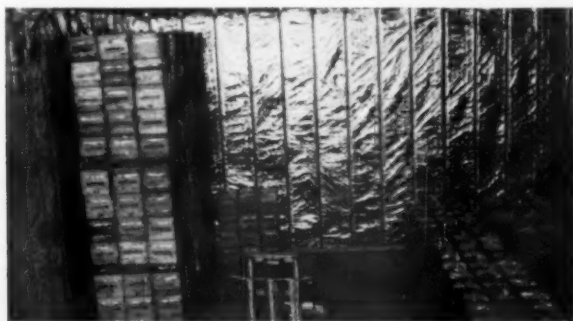
Power pruning has greatly aided their quality control as it enables them to prune the trees in the manner they desire. Formerly when pruning with hand pruners, they found too much droopy growth was left in the trees. Now by pruning from the outside in, they get rid of this type of wood.

This is important since the Garwoods do not maintain highly vigorous trees. They do not believe in producing abundant shoot growth each summer only to remove much of it the following winter. Their less vigorous trees produce earlier coloring fruit which enables them to take advantage of the early season market.

Two brothers now do the pruning job formerly performed by five hired men. Two of them working together can prune 25 to 60 mature trees a day, depending upon conditions. One man works on the ground with a 6-foot pruner reaching about 13 feet in height and the other works inside the tree with the 4-foot pruner. They are very satisfied with electric pruners, since there is no opening and closing of the pruning head and no freeze-ups.

Investment of \$700 in a 100-inch, two-spindle rotary cutter (Ford Motor Co., Birmingham, Mich.) for mowing and brush disposal has resulted in another satisfactory laborsaving operation. Although Gene feels the machine pays for itself in mowing alone, it also does a fine job of cutting prunings.

The Garwoods found that two round trips on each row will chop about 90% of the brush, providing that they can get under most of the

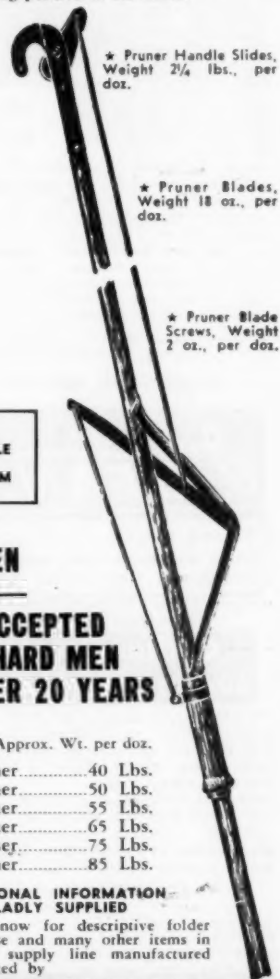


The Garwoods trimmed costs by insulating their 16,000-bushel storage with aluminum foil (about 14 cents per square foot).

WELLS & WADE THE STANDARD FOR NORTHWEST GROWERS

Pump gun action, light but durable structure, and cutting power created by leverage, make the WELLS & WADE PRUNER the ideal pruning instrument. Workmen actually do 50 to 100 per cent more pruning per day with no more, and often less, exertion.

The pump gun features of the W. & W. PRUNER enable workmen to use both hands for guiding the blade, and the cutting is performed without shifting position of the hands.



* Pruner Handle Slides, Weight 2 1/4 lbs., per doz.

* Pruner Blades, Weight 18 oz., per doz.

* Pruner Blade Screws, Weight 2 oz., per doz.

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**A PROVEN
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WELL ACCEPTED
BY ORCHARD MEN
FOR OVER 20 YEARS**

Approx. Wt. per doz.

6-Ft. Pruner.....	40 Lbs.
8-Ft. Pruner.....	50 Lbs.
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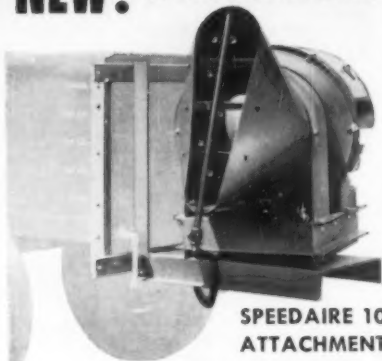
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We specialize in Orchard Pruning
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DIG HOLES SITTING DOWN!

Some unit digs anger slow from 4" to 24". By removing pin and replacing digger unit with swivel hook assembly, digger frame becomes crane boom. Use Danuser Adapter Kits on tractors not equipped with 3-point hitch. Write for free information.

DANUSER MACHINE CO.
500 East 3rd St. • Fulton, Missouri



Jim Garwood displays 10-pound polyethylene consumer package. Replacing bushel baskets, bags save space, are easier to handle.

trees. The remaining scraps left on an acre can be thrown into the alley by hand in about 30 minutes. They estimate that about nine minutes machine time and 39 minutes labor are involved per acre and that the machine saves about two-thirds of their former cost of brush removal.

The rotary-type cutter has also eliminated the serious maintenance problems formerly encountered with their industrial sickle-bar mowers. Besides saving on repair cost, they save on time because they can hook up very rapidly to the rotary cutter.

Live power take-off on the tractor used with the rotary cutter is very convenient for shifting on the go and for stopping to grind a heavy pile of brush. Power steering makes it easier to move through and around the trees. Gene states they have hit dozens of rocks and stumps with no apparent damage.

Expanding the cold storage facilities of the Garwood Orchards has permitted them to do part of their packing during the winter months. This has eliminated much of the extra labor required for grading and packing at harvesttime.

The cost-cutting construction methods on their new cold storage were considered quite revolutionary. They used 4 inches of reinforced concrete poured on sand for a floor, second grade cement blocks for walls, and tied-arch laminated rafters for a roof. Their roof sheeting is 1/2-inch CD plywood and three layers of 15-pound felt roofing laid on with hot asphalt for built-up roofing.

The greatest cost saving was obtained by using reflective aluminum accordion foil insulation which cost about 14 cents per square foot to install. They purchased low-grade 2x4's, nailed them on the walls as studs on 24-inch centers with iron nails, and used a staple gun to attach the foil to the faces of the studs.

Using their fork-lift truck for pallet handling and bulk bins for scaf-

folds, the Garwoods handled essentially all the storage construction problems themselves. They purchased a used compressor and motor, put in another well, hung four new evaporator units from the top center of the arched rafters, and obtained a 16,000-bushel storage for about 56 cents per bushel. This 56 cents represents material cost only, and not their own labor.

The Garwoods no longer use bushel baskets in retail sales. They found that bushel baskets were expensive, bruised fruit in handling, were too large for modern households, too heavy for consumers to handle, required large floor space in their sales area, were poor storage containers, and tended to result in high clerking costs.

Realizing that apple marketing is now largely by weight or number rather than by volume, the Garwoods have shifted, for their consumer sales, to 10- and 20-pound polyethylene bags (Saylor Corp., St. Louis, Mo.). They use the same bagging machines (Wayland Machinery Co., Coveseville, Va.) as used for their 4-pound shipping bag, the same printing plate, bulk bins to store the packages 16 feet high in storage, and find their apples have three times the shelf life as compared to those in bushel baskets.

The large poly bags enable them to use only one-third the amount of clerical help formerly required on busy sale days and two men to perform the work formerly accomplished by six. The need for additional display and parking area for their expanding local sales was also eliminated.

Through mechanization, the Garwood brothers are decreasing their labor needs as rapidly as economically feasible. With wages increasing each year and good workers increasingly difficult to find, the Garwoods are solving their labor problem by doing the job properly themselves by means of a machine and often at a lower cost.

THE END.

FRUIT-O-SCOPE

SPECIAL MARKET REPORT

JANUARY, 1961

AMERICAN FRUIT GROWER

What's the connection between automobiles and apples? Apple growers are dancing with joy because the Dodge auto company has chosen for its 1961 slogan, "Dodge Upsets the Apple Cart." Apples are expected to be featured right along with the national auto advertising.

A 145-page report from Stanford Research Institute, "Investment Opportunities in Victoria, Australia," points up the possibilities for developing the frozen juice concentrate market "down under." At least one major U. S. frozen citrus juice manufacturer is beyond the "eying" stage of considering Australia in its expansion plans.

Double page ads in Life Magazine and a six-page spread in McCall's are promoting Reddi-Made Jellied Cherry Sauce, a new Michigan cherry product. Cherry Growers, Inc., Traverse City, and Michigan Fruit Cannery, Benton Harbor, have enough faith in their new product to risk a budget of over \$500,000 for national promotion and advertising.

What's the prospect for profitable apple sales in the Bay state? Massachusetts Fruit Growers' Association Marketing Committee gives the following four-point plan to make the most of the apple opportunity. Step up and maintain advertising...do everything possible to get good merchandising...move the apples that need to be moved while they are still crisp...make sure that all outlets within reach have some good apples to sell.

Total production of fruit in 1961 is expected to be somewhat larger than in 1960. The 1960 apple crop of slightly over 107 million bushels was 12% smaller than in 1959. The pear crop of slightly under 26.5 million bushels was 13% below 1959 but the peach crop of about 74.7 million bushels was a little above the previous year.

Despite the growing population rate in the U. S., the consumption of fresh fruits and vegetables has not increased accordingly. In the opinion of S. R. Smith, director of USDA's fruit and vegetable division of Agricultural Marketing Service, this industry is "treading water." One factor, he thinks, is that retail prices of fresh fruits and vegetables, on the average, have advanced more since the war than the processed.

It's predicted that plastic film will cause strawberry growers in Florida to double their acreage within a year or two. At the same time, though, a price slump is expected...as a result of three or four times the present volume of berries with the existing marketing system.

Thirty-three apple warehouses have been struck by the teamsters' union in Yakima, Wash. Demands are for a closed shop and wage and fringe increases. According to reports, employers are resisting. In retaliation, teamsters' officials have designated Los Angeles as the springboard for the threatened national boycott of apples from Washington state's \$47 million crop.

What's in the future? William Beverly Murphy, president of Campbell Soup Co., predicts that by 1970 the growth rate of convenience foods will more than double the growth rate for foods in general. This means more preparation and packaging by grower and middleman.

STATE NEWS

The Business Side of Fruit Growing

OREGON

Diamond Jubilee Meeting

At the 75th annual meeting of Oregon State Horticultural Society, held November 17-18 at Corvallis, a panel on labor unions and seasonal agricultural labor attracted special attention. Speakers included John Zuckerman, representing the Council of



New officers of Oregon State Horticultural Society are (seated, left to right) James S. Smart, Salem, first vice president; Stephen G. Nye, Medford, president; William J. Vollmer, Jr., Parkdale, second vice president; (standing, left to right) Andrew A. Duncan, Corvallis, secretary; and William Hazeltine, Parkdale, retiring president and new trustee.

California Growers, and Norman Smith, director of Agricultural Workers Organizing Committee.

Smith stated that organization and unionization of the agricultural labor force would insure growers a ready supply of labor in addition to improving the economic standard of agricultural workers and raising the level of the general economy.

Zuckerman maintained that the union has not been successful in organizing farm workers because farm workers don't want to be organized. He said that the union has only succeeded in harassing growers and coming close to wrecking California agriculture. Unionization of farm workers would mean the end of the family-size farm, Zuckerman added, because unrealistic wages and working conditions would result in automation and mechanization that would not be within the means of the family-size operation.

ILLINOIS

Quality Standards

THE Illinois Maturity Standards for Golden Delicious apples can be used to achieve quality segregation when packing from storage as well as at harvest, according to re-

search work at University of Illinois.

Dr. Richard V. Lott, professor of pomology at the university, developed these standards to provide consumers with Golden Delicious apple packs having relatively uniform quality and to eliminate low-quality Golden from the pack. Specifications for the standards contain information for their use when packing from storage.

These are color standards which are made up as 2 3/4 x 5-inch cards, with each card having the color specified for one of the three grades, No. 1, Fancy, and Extra Fancy. The color of the card is compared with that of the apple skin, the color being the greenest allowed for the grade designated on the card.

Sets of the three standard cards are available for \$3 from: Richard V. Lott, Department of Horticulture, University of Illinois, Urbana, Ill. Remittance should be made payable to the university.

FLORIDA

30,000 Acres of Citrus

MINUTE Maid Corporation is adding close to 4000 acres of raw land near Indiantown to its citrus properties. This is in addition to the 8000 acres being drained and cleared in St. Johns River swamps west of Ft. Pierce. In both developments pre-

planting operations are expected to be completed by the fall of 1962.

Minute Maid's latest acquisition alone will add 250,000 trees to its citrus enterprise. Officials estimate that the corporation will invest \$2 million over the next five or six years in transforming the 4000 acres into producing citrus land.

With the acquisition of the Indian-town acreage, Minute Maid now owns or operates nearly 30,000 acres of citrus land in production or under development in the state.

CALIFORNIA

Processing Co-op Formed

A GROWER'S co-operative for the processing of fruits and vegetables has recently set up headquarters in Sunnyvale. Called Valley Canning Cooperative, Inc., the co-op is negotiating for a large, already-established facility to process a variety of fruits and vegetables including apricots, cling peaches, cherries, free-stone peaches, pears, tomatoes, and spinach.

The co-op has announced that it is actively signing up membership throughout the San Joaquin and Sacramento valleys and coastal areas. Interested growers are advised to contact Clarence Lapp, temporary manager, at the organization's head-



LENNON SISTERS SPARK PIE BAKING CONTESTS

Shown presenting a 30-inch apple pie to 4-H boys and girls at the Indiana State Fair are the Lennon sisters of TV fame. The pie contained 40 pounds of apple slices, 6 pounds of lard, and 19 pounds of crust. It was baked to publicize two apple pie baking contests in the Hoosier state sponsored by Indiana Fruit Growers Cooperative Association, Inc.



Send Your Apples to Market at Their Very Best
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Consumer size units include 2, 4 and 8 quart baskets with wood or wire handles optional; easy, fast set-up; shipped flat for convenient storage. Also, an inexpensive functional design farm basket, in 2 and 4 quart sizes, for general roadside stand use.

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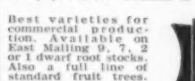
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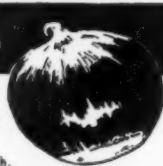
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quarters at 251 S. Murphy, or the offices of California Freestone Peach Association, 15th and East, Modesto, which is acting as a clearing house for information concerning the new co-operative.

The AFL-CIO Agricultural Workers Organizing Committee finally succeeded in securing a union shop agreement with a California grower. When the olive ranch of Henry Hedrich, Corning, was struck by AWOC and the State Department of Employment ruled that a bona fide labor dispute existed, aged olive grower Hedrich signed a union contract agreeing to pay a picking rate of \$1.25 per 35-pound lug.

Industry spokesmen feel that Hedrich's acceptance of AWOC terms was an unusual situation and does not mean that the union has gained sufficient strength to demand a general union shop on California farms.

Elsewhere in the Golden state growers are making plans to organize farm labor associations to recruit and place workers independently of the State Farm Placement Service for next year's harvest. Growers are also preparing to seek legislation that will make them less vulnerable to labor disputes when perishable crops are ready to be picked.

ARKANSAS

New Processing Plant

A SMALL peach processing plant operated last season by Lloyd Yarbrough, Clarksville, proved so successful that local peach industry leaders have joined forces to establish a \$300,000 processing plant before the harvest of next season's peach crop.

Already named Johnson County Frozen Food, Inc., the plant will process peaches too ripe for hauling to distant markets. Johnson County is one of the principal peach producing centers in the state.

CONNECTICUT

Marketing Order Explained

APPLE growers in the state are expressing considerable interest in a statewide apple marketing order. However, there seems to be some confusion on the difference between a marketing order and the legislation which enables a marketing order to be put into effect, according to Raymond Farrish, extension economist at University of Connecticut.

Enabling legislation must be passed by the legislature before any specific marketing order can be considered, but it does not mean an order will be put into effect, Farrish points out. Enabling legislation only permits



LADY HEADS HORT SOCIETY

The first lady president in the history of the 38 state horticultural societies in the United States was elected at the 73rd annual meeting of Florida State Horticultural Society held in Tampa. She is Mrs. Ruth S. Wedgeworth, Belle Glade, a leading celery producer and rancher.

some state agency (probably the commissioner of agriculture) to put an order into effect if it is approved by a vote of the producers affected.

If producers do not approve of any specific marketing order, it cannot be adopted even though enabling legislation has been passed, Farrish explains. Once enabling legislation has been passed, however, specific proposals can be made for an order and public hearings held before the proposed order is submitted to the producers concerned for a vote. It is then up to the producers to either approve or disapprove of the order under consideration.

BARGAINING

Legislation Proposed

A PROPOSED law for safeguarding agricultural bargaining associations was drafted in the fall of 1960 by interested grower groups in the Golden state. If the bill passes, it will be the first agricultural bargaining association legislation in the state's codes.

Purpose of the proposed bill is to protect the rights of growers to organize for group bargaining with respect to the sale of raw fruit and vegetable produce.

The bill was jointly drafted by Richard Owens, secretary-treasurer, California Farm Bureau Federation; Richard Johnsen, executive secretary, Agricultural Council of California; J. B. Quinn, master, California State Grange; Ralph Bunje, manager, California Cling Peach Association; and Neil Holbrook, manager, California Processing Apple Growers.

JANUARY, 1961

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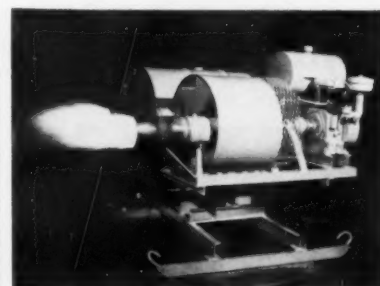
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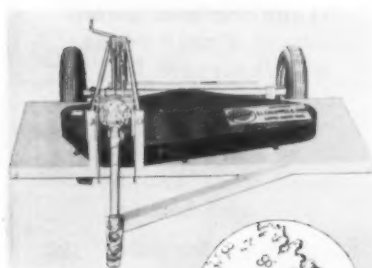
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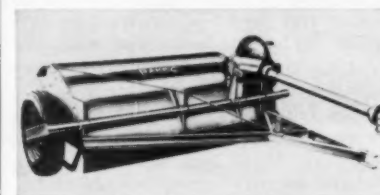
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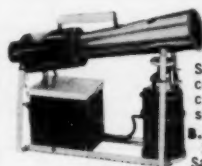


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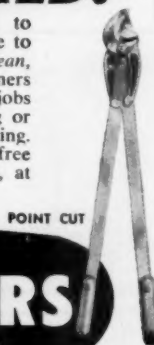
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Mechanization and Migrant Labor

ANY fruit grower who saw the recent TV performance "Harvest of Shame," dealing with migrant farm labor, must have felt some chills run up and down his spine after he got through jumping up and down in outrage and anger. And when he cooled off, he must have shaken his head with both misgivings and forebodings.

This was one of the most outrageous and sensational presentations ever made to the American public by supposedly honest and responsible parties. All the worst about migrant labor was packaged together and "sold" as typical. It was grossly unfair to the thousands of growers who handle their help fairly and well.

One cannot help but wonder what other distortions we are being fed by the modern techniques of mass communication. If we are, then this is frightening and dangerous to our society and to our country. What confidence can we have in TV and radio and press to give us the fair, unbiased picture? Are these media going to be used for distortions and propaganda purposes as part of well-organized schemes? What can a man believe?

Never mind the merits of the case, an effective job was done in creating a national image of the exploitation of migrant labor, like "we used to own slaves; now we just rent them!" And this image will not be changed over night.

We can and must fight back with all our power. We can and must show the other side of the coin—the satisfied harvesters and their families who come to the same farm year after year—happy and well taken care of. This is something to do and to do quickly.

And one cannot help but wonder where was the responsible leadership in agriculture while this film was being prepared. Who looks after the interests of agriculture? Can you imagine a film of that nature being presented against some of our major business enterprises without their knowing and doing something about it? It looks as though some high placed leadership in agriculture just plain "goofed" and let us down.

But if there was ever a TV show

that advertised the necessity for mechanization, "Harvest of Shame" was it. "We are fortunate that our engineers and manufacturers have moved us along the road as rapidly as they have. We are late even now."

The pages of this issue of AMERICAN FRUIT GROWER are more valuable and more pointed than ever. They will be read with increased interest in the light of "Harvest of Shame."

Happy Exception

CITRUS growers are luckier than most growers—their share of our food dollar increases as the amount of processing increases. The citrus grower receives 32 cents of the dollar spent for oranges, 38 cents when consumers purchase canned orange juice, and 43 cents when frozen orange juice is purchased.

Compare this to the plight of the grower of green beans. When consumers purchase fresh green beans, the grower receives 43 cents of each dollar. But when consumers purchase frozen green beans, his share drops to 19 cents.

As a general rule, the grower's share of our food dollar declines as the amount of food processing increases. The happy citrus grower is the exception to the rule.

Fruit Growing is Such Fun!



"We never seem to have enough power!"

Fruit Talk

English pear growers are concerned over a recent local attack of **fire blight**, a disease which has fortunately so far left English pear orchards relatively unharmed.

Germany reports that **starlings** can be driven from orchards by flying **helicopters** over the areas at dusk.

A report from **Europe** says that the main trouble with apple juice is that it "**tastes like apples**." The idea seems to be to disguise the apple flavor and then the apple juice will sell! **There is no accounting for tastes!**

Reports on **mechanical harvesting** of cherries are to the effect that a harvesting machine costing \$6,000 to \$10,000 with a crew of 5 to 7 men can harvest **120 tons in 15 days** of 8 hours, at a cost of 1½ cents per pound compared with 3 cents, and replacing 40 people.

Dutch farmers claim to be 10 years ahead of competitors in determining fertilizer needs by means of an **IBM RA MAC 305 computer**, owned by them, into which is fed information on soil analysis, soil depth, and soil origin—with **210,000 samples computed in 1959** and a goal of 400,000 ahead.

Says a **wildlife management research worker** after exhaustive studies of bird repellents ranging from stuffed hawks, electrical bird snappers, **motor driven hawk decoys (!)**, firecrackers, reflectors, spinners, **artificial snakes**, scarecrows, balloons, shotguns, to live tethered birds, "Based on a **wealth of negative knowledge** accumulated during the past four years, solution of this problem **points strongly toward total enclosure of the crop involved**." Which is the choicely worded understatement of the year!

"Marketing through **bargaining** is a method whereby the **grower assumes leadership** in overseeing the trip that his commodity takes in getting to the consumer," concludes R. S. Kill of Lockport, N.Y.

The **14,000 Italian apple growers** in the Ferrara district are adding 7500 acres a year to their 101,000 acres, only half of which is in full production, producing **35 million bushels** with yields of 700 to 2000 bushels per acre, and with hope of dominating the **European apple market**.

It takes four years of work and \$3500 to bring an **acre of cranberries** into production, according to **Earl R. Baker** of Washington state.

Reports from **Germany** tell of the magnitude of host plants which harbor a **virus disorder** of grapes—**17 species** of plants, including both weeds and cultivated crops.

Leaf petioles have been found more sensitive than leaf blades for **phosphorus** determinations in apples in **Japan**.
—H.B.T.

Coming Next Month

- You Can Grow Russet-Free Golden Delicious
- A Nationwide Look at Insect Control
- How New Jersey's Paul Prince Sprays His Strawberry Crop
- Combatting Fruit Diseases
- Proper Timing Cuts Spraying Costs

AMERICAN FRUIT GROWER



Unmatched power-weight ratio gives the "460" unexcelled traction and lugging ability for heavy-duty tillage.



Handle big sprayers easily, with the "460's" 48 drawbar horsepower and 10 speeds forward with TA.



Front-mounted fork lift for the International 460 Utility has 2,000-pound capacity, 10½-foot lift.

From spraying to picking, you get **big help with an International 460 Utility**

Here's a tractor that never says "can't" when you have to meet tight spray and tillage schedules, or face the picking season with a shortage of help!

For heavy pulling, the Multi-Range six-cylinder engine combines with over 4,800 pounds of built-in brawn (even more in the Diesel model) to deliver 48 of the smoothest-pulling drawbar "horses" you've ever used. Equip the "460" with Torque Amplifier drive, and you have 10 speeds forward, 1.8 to 16.5 mph. For even wider speed range, throttle back in any gear—the husky Multi-Range engine hangs onto the load without a whimper.

For husky, compact Diesel power in a new economy "package," ask your IH dealer about the International B-275—an amazing performer with over 30 drawbar hp, eight forward speeds, and pull-boosting differential lock.

At picking time, quickly attach a front-end lift for handling 20-bushel boxes—the 460 and your tractor operator can do the work of two or three men, compared with loading and unloading trucks with boxes or crates by hand... The 460 Utility is available with gasoline, Diesel, or LP Gas engine and with orchard fenders or full rear wheel cowling. Your IH Dealer will be glad to demonstrate—why not see him soon?

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International Harvester Products pay for themselves in use—Farm Tractors and Equipment...Twine...Industrial Tractors and Equipment...Motor Trucks...Construction Equipment—General Office, Chicago 1, Illinois.

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NOTHING BEATS CAPTAN

Captan is so effective at all stages of fruit growth, you don't have to switch from one basic fungicide to another as the season progresses. This is why many growers call Captan the *all-season* fungicide.

Stauffer Captan 50-W reduces apple scab to a minor problem when used straight through from pre-bloom to harvest. Scab control becomes easier and easier in succeeding years because fewer spores are left to overwinter. Control can then be accomplished with reduced dosage rates—as low as one pound of Captan per hundred gallons of water.

Captan controls scab three ways: (1) Applied before an infection period, it protects fruit and foliage from infection; (2) applied shortly after infection occurs, it kills the scab fungus; and (3) applied when scab spots first appear it inactivates the spots and prevents further infection.

Captan controls major summer diseases, and can be used right up to day of harvest to help protect fruit against storage rots and storage scab. It helps fruit develop fine color and finish. In

pre-bloom sprays, it teams up with sulfur to control powdery mildew and scab.

Stauffer Captan is also available as a dust for ground or aerial application where early season weather conditions make it difficult to get into an orchard with spray equipment.

No other fungicide beats Captan for control of scab and summer diseases on apples . . . for rots, leaf spot, blossom blight, scab and other diseases on peaches, cherries, grapes, pears, plums and berries. Write for a new pamphlet. Stauffer Chemical Company, 380 Madison Avenue, New York 17, New York.



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